THE ARCHITECTURAL FORUM

C. L. Watson

Arch

Ralph H Poole

House

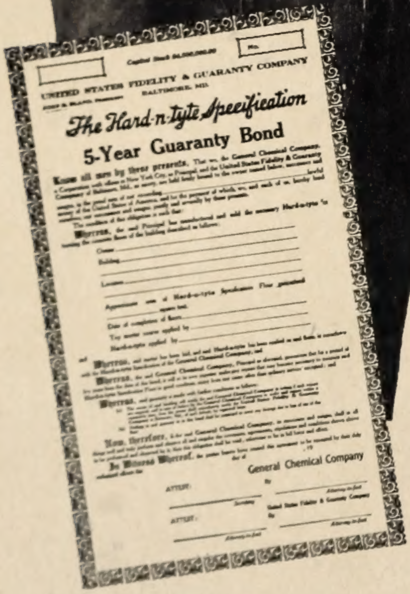
Chas G. King

House

Chicago

APRIL
1922

Concrete Pavement, Troy, N. Y.
Hard-n-tyte Road Treatment used.


UNITED STATES FIDELITY & GUARANTY COMPANY
BALTIMORE, MD.

The Hard-n-tyte Specification
5-Year Guaranty Bond

Know all men by these presents.

General Chemical Company

A post card brings you
a copy of this bond

Build concrete floors that will stand as much hard traffic as *that* road.

—Concrete floors insured by a Guaranty Bond!

THAT concrete road stands more wear in a day than the average floor gets in a month. Grinding horse shoes, biting tire chains and the suction of speeding rubber are doing their best to dig out small particles and bring about that condition known as "dusting." But it never happens on the mosaic-like surface produced by Hard-n-tyte.

The silicates and fluorides on the Hard-n-tyte Specification Floor are almost indestructible under traffic and absolutely insoluble in water. That is why Hard-n-tyte Specification Floors will stand abuse for years without showing any sign of wear—more abuse than the average concrete floor is ever given.

But to protect the interests of all concerned, every Hard-n-tyte Specification Floor is insured against soft spots, "dusting," or other signs of wearing under traffic, for five years by a Guaranty Bond of the U. S. Fidelity & Guaranty Company. And you may rest assured that a long life, many times five years, must have been established before Hard-n-tyte received the guaranty of a bonding company.

A post card will bring you a copy of the Hard-n-tyte Specification and a sample of the bond.

General Chemical Company
1710 Broad Exchange Bldg., New York City

For over twenty years the General Chemical Company has been at the fore front of chemical research and manufacture in this country. The Hard-n-tyte Specification is the latest contribution of its splendid staff of chemists. It is the successful result of long search for a concrete floor hardener that *really hardens* the floor and *materially increases* its life. It enables engineers and architects to give their clients a quality of concrete work far in advance of anything that has been possible heretofore.

Hard-n-tyte Specification Floors

—dustless, long-wearing concrete

A Mountain of Proof

FOR over a quarter century Natco Hollow Tile has been demonstrating its exclusive advantages as a unit for practically every type of building. The amount of Natco Tile that has been used since the first blocks were laid in 1889 would make a giant pyramid that would dwarf the tallest structure. Natco is the backbone of the Woolworth Building and many other famous skyscrapers. It has built a great city of homes and a countless number of enduring farm buildings.

Natco Hollow Tile is increasing in popularity every year and offers profitable returns in prestige, satisfaction and hard cash to architects, builders and building supply dealers everywhere. Our architectural and building literature is free. Dealers should investigate our interesting proposition.

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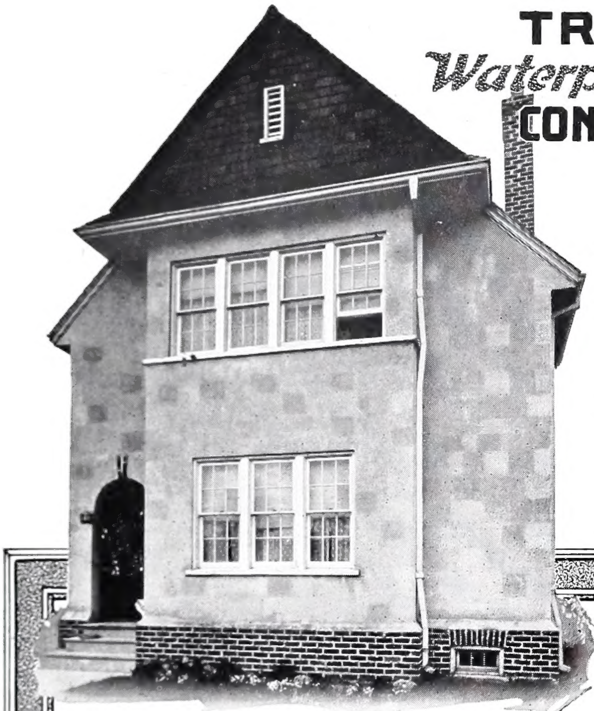
·COMPANY·
1406 FULTON BUILDING
PITTSBURGH, PA.

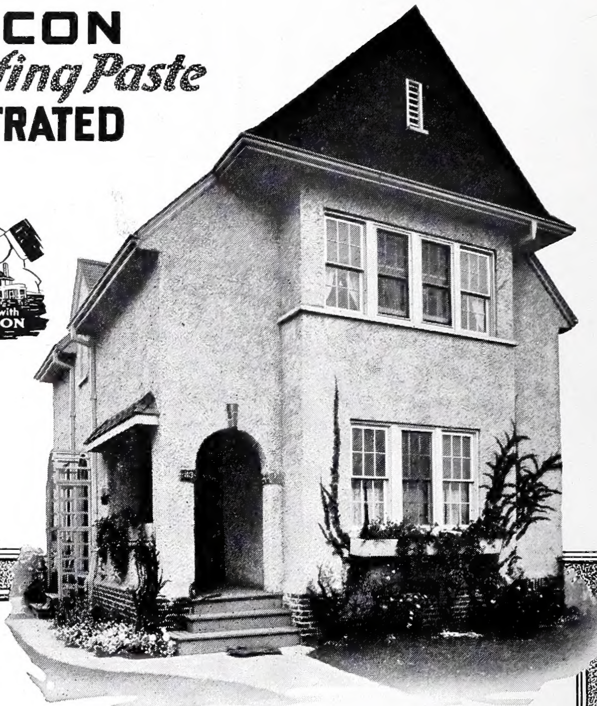
NATCO HOLLOW TILE

TRUSCON
Waterproofing Paste
CONCENTRATED

You could dip *this* house *in* water
Protected with TRUSCON



No Waterproofing used
in this Stucco



Waterproofing *was* used
in this Stucco

WHY THE MOTTLED STUCCO?
OF THE HOUSE ON THE LEFT

THE house at the left is an instance of what may happen when waterproofing is not used in stucco. Difference of absorption of various sections of the wall underlying the stucco, and the normal porosity of the stucco itself, may sometimes result in a checkered appearance.

Cement stucco is a beautiful form of construction; it is attractive and durable — but like all masonry, stucco should be waterproofed. Because stucco is porous. Even a concrete wall is porous and absorbs water — how much more permeable to water must a thin shell of stucco be?

We were unusually fortunate in being able to obtain these two pictures of stucco construction from the Lansdowne Park Company, Brantford, Ont. It just happened that the first 13 houses which they built on a contract of 50 were finished with unwaterproofed stucco. The house at the left, with its mottled appearance, is an example. The house at the right is representative of the remaining 37, which were waterproofed with Truscon Waterproofing Paste, *Concentrated.*

Truscon Waterproofing Paste has other advantages besides that of waterproofing. It makes a rich, creamy stucco which is very satisfactory to apply. It kills absorption, producing an even textured stucco. It keeps water out of the surface and prevents hair-checks, mottling and serious stucco discolorations.

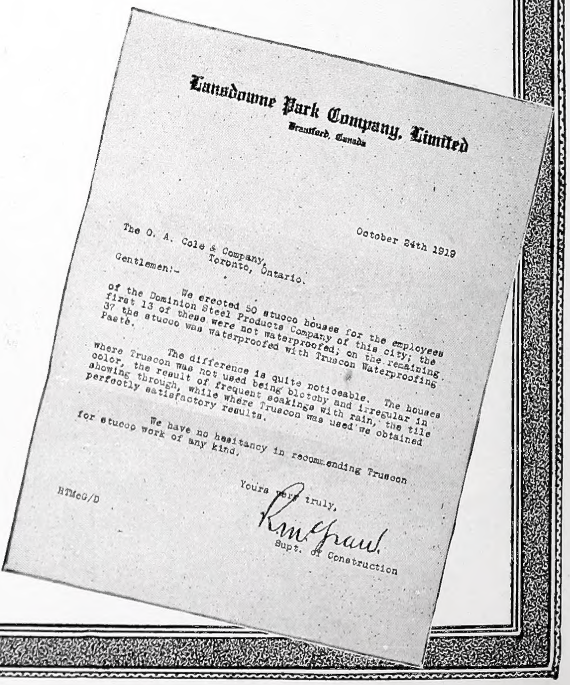
THE TRUSCON
LABORATORIES

The World's Largest
Manufacturers of Integral
Waterproofings

DETROIT, MICHIGAN

Should you be interested in the subject of waterproofed stucco, we will gladly send you specifications. Ask for "Science and Practice of Integral Waterproofing".

Facsimile of letter from the Lansdowne Park Company, Ltd., Brantford, Ont., on the advantages of Waterproofing in Cement Stucco



Lansdowne Park Company, Limited
Brantford, Canada

October 24th 1919

The O. A. Cole & Company,
Toronto, Ontario.

Gentlemen:-

We erected 50 stucco houses for the employees of the Dominion Steel Products Company of this city; the first 13 of these were not waterproofed; on the remaining 37 the stucco was waterproofed with Truscon Waterproofing Paste.

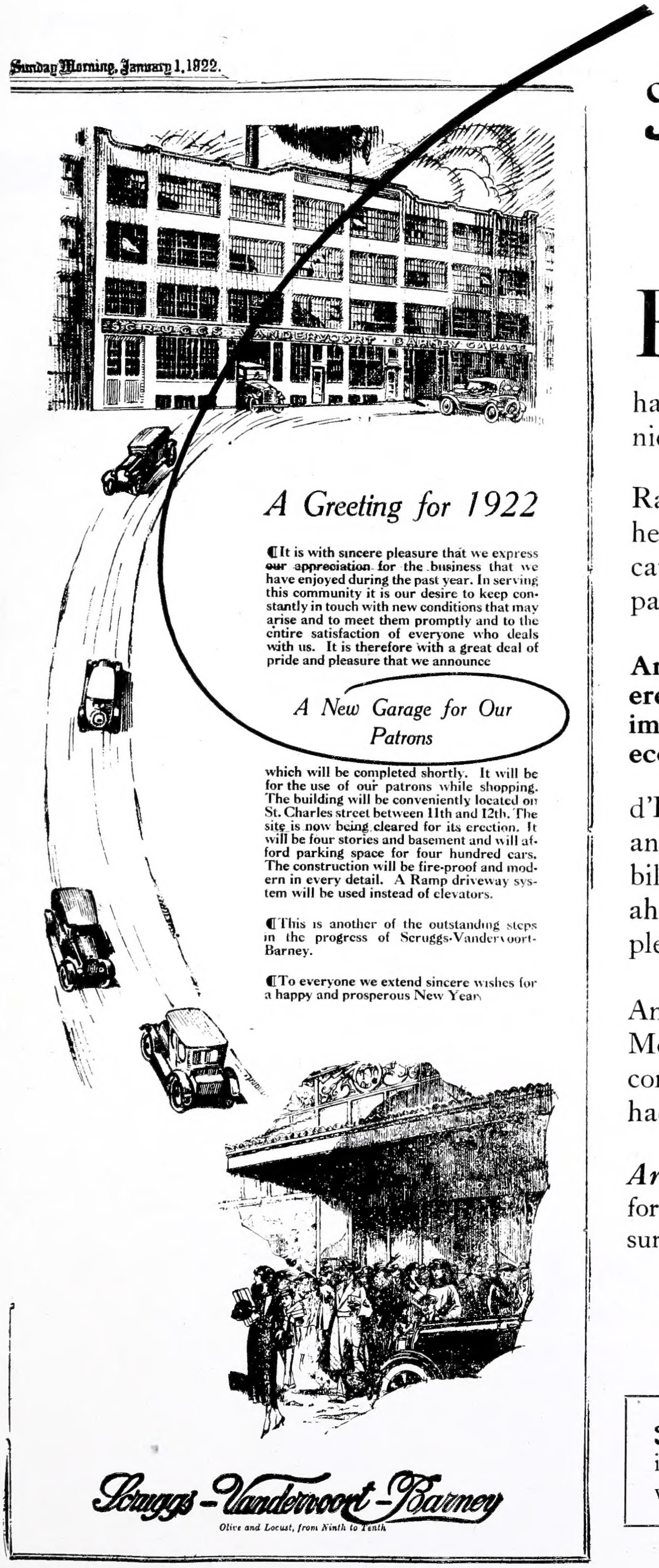
The difference is quite noticeable. The houses where Truscon was not used being blotchy and irregular in color, the result of frequent soakings with rain, the tile showing through, while where Truscon was used we obtained perfectly satisfactory results.

We have no hesitancy in recommending Truscon for stucco work of any kind.

Yours very truly,

Supt. of Construction

HTMcG/D


SCRUGGS-VANDERVOORT-BARNEY GARAGE

Sunday Morning, January 1, 1922.

A Greeting for 1922

It is with sincere pleasure that we express our appreciation for the business that we have enjoyed during the past year. In serving this community it is our desire to keep constantly in touch with new conditions that may arise and to meet them promptly and to the entire satisfaction of everyone who deals with us. It is therefore with a great deal of pride and pleasure that we announce

A New Garage for Our Patrons

which will be completed shortly. It will be for the use of our patrons while shopping. The building will be conveniently located on St. Charles street between 11th and 12th. The site is now being cleared for its erection. It will be four stories and basement and will afford parking space for four hundred cars. The construction will be fire-proof and modern in every detail. A Ramp driveway system will be used instead of elevators.

This is another of the outstanding steps in the progress of Scruggs-Vandervoort-Barney.

To everyone we extend sincere wishes for a happy and prosperous New Year

Scruggs-Vandervoort-Barney

Olive and Locust, from Ninth to Tenth

Lessee—Scruggs-Vandervoort-Barney Dry Goods Co.
Owner—Roy Langenberg.
Builder—John Hill Construction Co.
Location—St. Louis, Mo.

And d'Humy Motoramps were chosen

FOR only by the use of this system of quick interfloor travel could this progressive Department Store feel that it had secured the maximum of safety, convenience and economy.

Ramps were selected because they avoid the heavy upkeep expense of elevators and because they provide instant service for patrons,—

And d'Humy Motoramps were chosen in preference to ordinary ramps because of their immensely greater safety, convenience and economy of space.

d'Humy Motoramps are half the usual length, and their sides are open, giving perfect visibility and enabling the motorist to see so far ahead that traffic entanglements are completely avoided.

And with all these advantages the d'Humy Motoramp System actually permits the accommodation of more cars than if elevators had been used.

Architects: This points the way to new business for you among your department store clients—surely a worth-while business to cultivate.

Miniature sketch plans for any job
on your boards will be gladly prepared
by us without charge or obligation

d'Humy Motoramps — a patented System of Building Design involving a combination of ramps with staggered floors.

Ramp Buildings Corp'n
115 Broad St., New York

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Facts:

Test the stack gases coming from a Kewanee Boiler and you'll find them many degrees cooler than the gases from other boilers. That means that the heat the boiler manufactures is absorbed by the water in the boiler and is ***not*** wasted up the stack. We have copies of interesting tests which ***prove*** this.

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KEWANEE, ILLINOIS

Steel Heating Boilers, Radiators, Tanks, Water Heating Garbage Burners

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DES MOINES	315 Hubbell Bldg.	DENVER	514 Boston Bldg.
KANSAS CITY	2014 Wyandotte St.	DALLAS	Southwestern Life Bldg.
INDIANAPOLIS	509 Occidental Bldg.	DETROIT	1772 Lafayette Boul.
ST. LOUIS	1212 Chemical Bldg.	TOLEDO	1121 Nicholas Bldg.
MINNEAPOLIS	708 Builders Exchange	CLEVELAND	706 Rose Bldg.
COLUMBUS, O.	808 1st Natl. Bank Bldg.	ATLANTA, GA.	1524-25 Candler Bldg.
SALT LAKE CITY	Scott Bldg.	SAN FRANCISCO	72 Fremont St.

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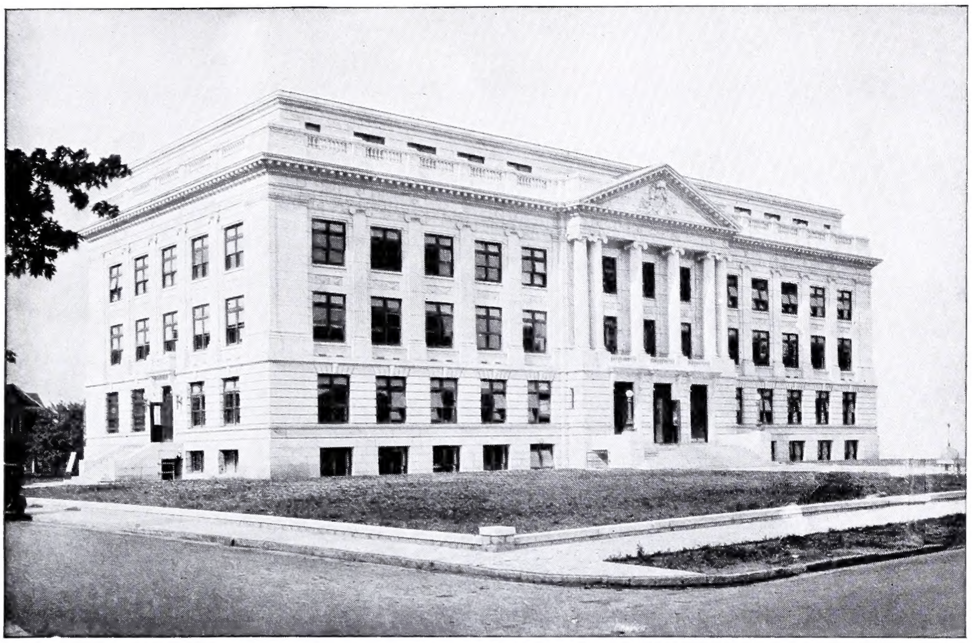

ATLANTIC Terra Cotta panels, column and pilaster capitals, massive pediment, cornice, balustrade, parapet and coping.

When detail repeats hundreds of times, it is well to remember: *the cost of Atlantic Terra Cotta per piece goes downward as the number of pieces goes up.*

An excellent example of Atlantic Terra Cotta for ornamental and moulded detail, and stone for plain surfaces in the lower stories.

"Questions Answered" on request

Guilford County Courthouse, Greensboro, N. C.; Harry Barton, Architect; W. P. Rose, Builder. Entirely of Atlantic Terra Cotta above the fourth story, from and including column and pilaster caps; conglomerate in color, taking up with granite of plain surfaces.

©

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350 Madison Avenue, New York

Southern Factory:

Atlanta Terra Cotta Company
Atlanta, Georgia

C. W. &
Geo. L.
Rapp,
Archts.

SPECIAL
GLAZE—
splash finish
of a pinkish
shade

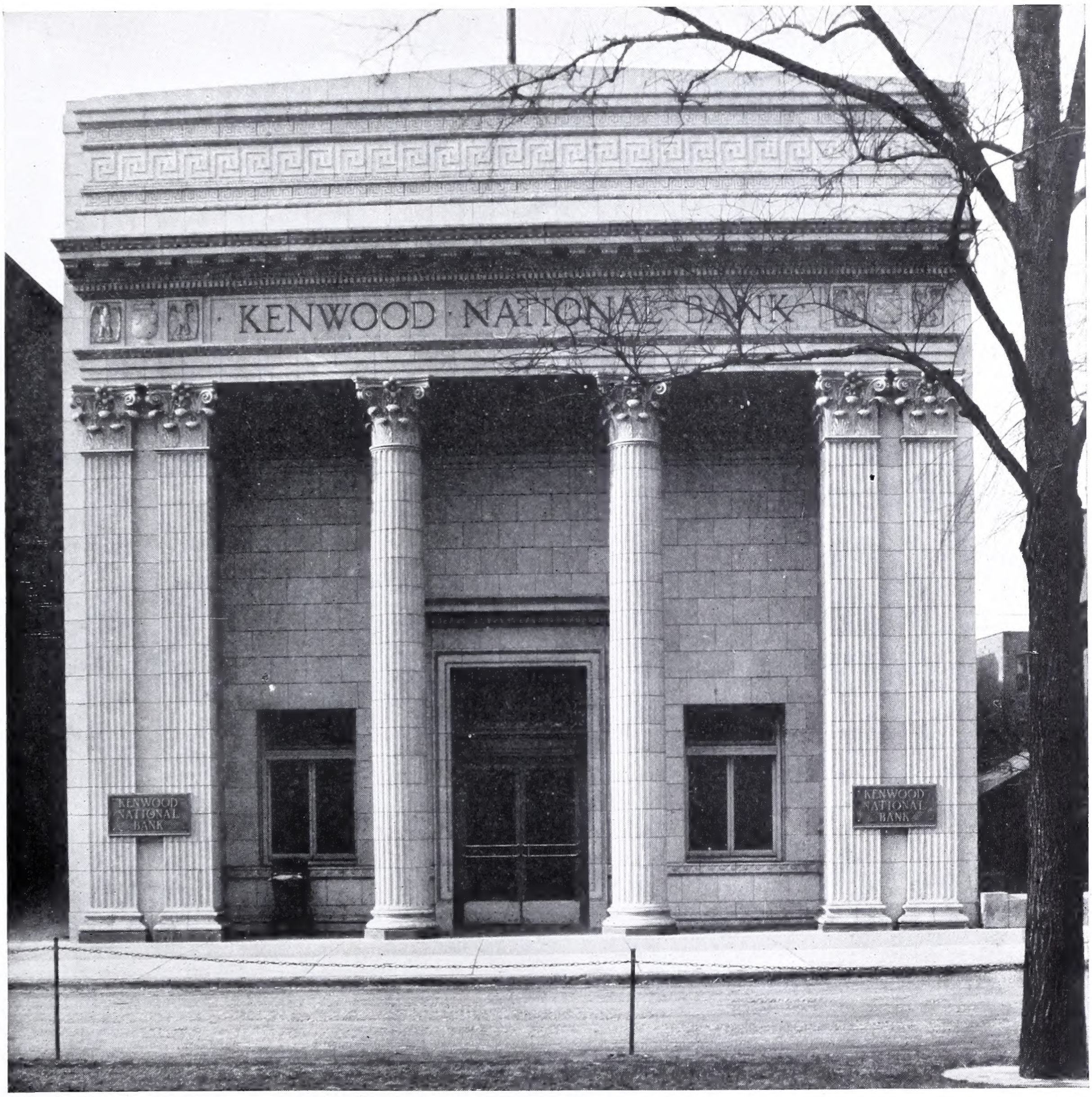
Entire building from curb up: Terra Cotta

KEITH THEATRE AND OFFICE BUILDING, CINCINNATI, OHIO

Pronounced one of the best looking buildings in the Middle West

THE NEW JERSEY TERRA COTTA COMPANY

OFFICE, SINGER BUILDING, NEW YORK CITY ESTABLISHED 1888 WORKS, PERTH AMBOY, NEW JERSEY



KENWOOD National Bank at 47th Street and Grand Boulevard, Chicago, Illinois; Henry L. Newhouse and F. M. Bernham, Architects.

Entire facade is of "Northwestern" matt glazed, light pink mottled terra cotta, with gold letters for name panel. Note, particularly, the perfect alignment of columns and pilasters and the architectural and mechanical excellence of the terra cotta throughout.

Whenever absolute dependability is required, wherever fine design and skillful workmanship are essential, "Northwestern" quality and service will be found pre-eminent.

NORTHWESTERN is a short form of specification for architectural Terra Cotta of superior quality.

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Tints of Color Hold the Future of Architecture

Our material furnishes them in acceptable,
lasting and cleanly form

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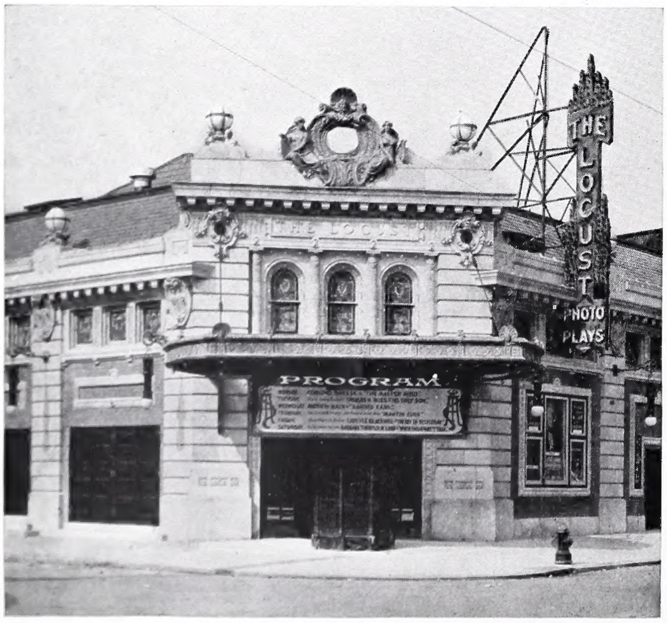
American Terra Cotta and Ceramic Co.
Chicago, Ill.



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Theaters demand an architectural treatment that expresses their purpose. Color, modeling and attractive ornament are distinctly an asset and a necessity. These features can be had at moderate cost in only one material,

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Technical and design facilities at our plant insure faithful execution of your specifications.

Motion Picture Theater, Philadelphia, Pa.
Stuckert & Sloan, *Architects*
Terra Cotta in cream glaze with a black splatter

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Washington, 234 Woodward Building
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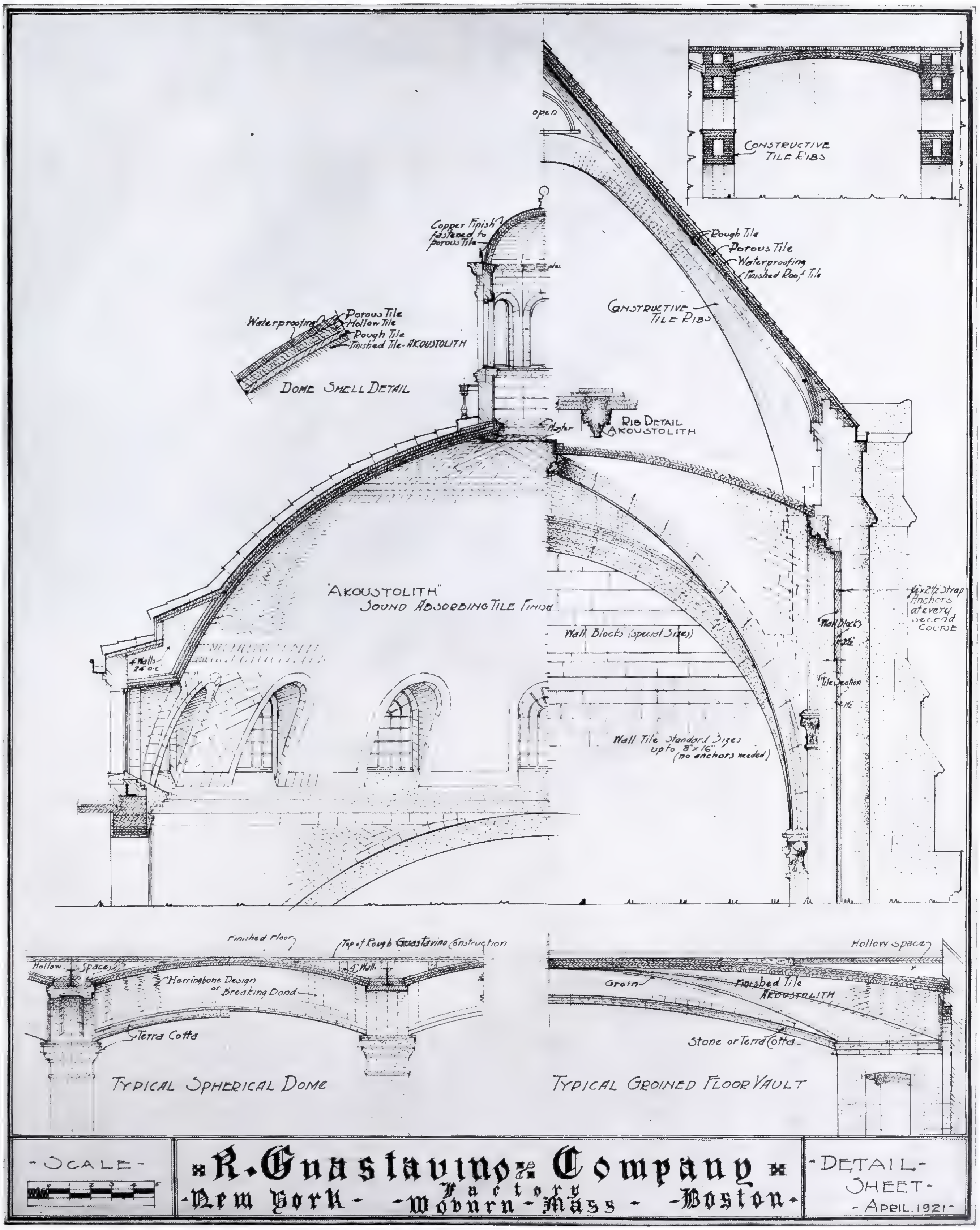
open
Constructive Tile Ribs
Copper Finish fastened to porous Tile
Rough Tile
Porous Tile
Waterproofing
Finished Roof Tile
Constructive Tile Ribs
Waterproofing
Porous Tile
Hollow Tile
Rough Tile
Finished Tile - AKOUSTOLITH
Dome Shell Detail
Plaster
Rib Detail
Akoustolith
"Akoustolith" Sound Absorbing Tile Finish
4" Walls 24" o.c.
Wall Blocks (special Sizes)
Wall Blocks
1/4 x 2 1/2 Strap Anchors at every second course
Tile Section
1 1/2
Wall Tile Standard Sizes up to 8" x 16" (no anchors needed)
Finished Floor
Top of Rough Guastavino Construction
Hollow Space
4" Walls
Herringbone Design or Breaking Bond
Terra Cotta
Typical Spherical Dome
Hollow Space
Groin
Finished Tile Akoustolith
Stone or Terra Cotta
Typical Groined Floor Vault
- Scale -
0 1 2 3 4 5
R. Guastavino Company
- New York - Factory - Woburn - Mass - - Boston -
- Detail - Sheet -
- April. 1921. -

MASTERPIECES IN MARBLE

SAMPLES DISPLAYED WITH ARCHITECTS SAMPLES CORP. NEW YORK CITY

A section of the huge Appalachian quarries in Knoxville, Tenn.

SEE OUR CATALOGUE IN SWEET'S

Nature has here formed five perfect and distinct varieties of beautiful marble—all available in any quantities.

We own the cream of the Tennessee Marble land. We have been buying choice quarries for fifteen years, so that today we have almost a monopoly on the finest grades of Tennessee Marble. Perfectly matched marble is assured when Appalachian Marble is specified. Our huge quarry holdings enable us to select our slabs so as to obtain absolute uniformity of coloring and pattern, no matter how large the order may be. Moreover, our quarries are so large that the architect can be sure that any Appalachian Marble specified today can be matched in years to come.

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In All Colors and Finishes

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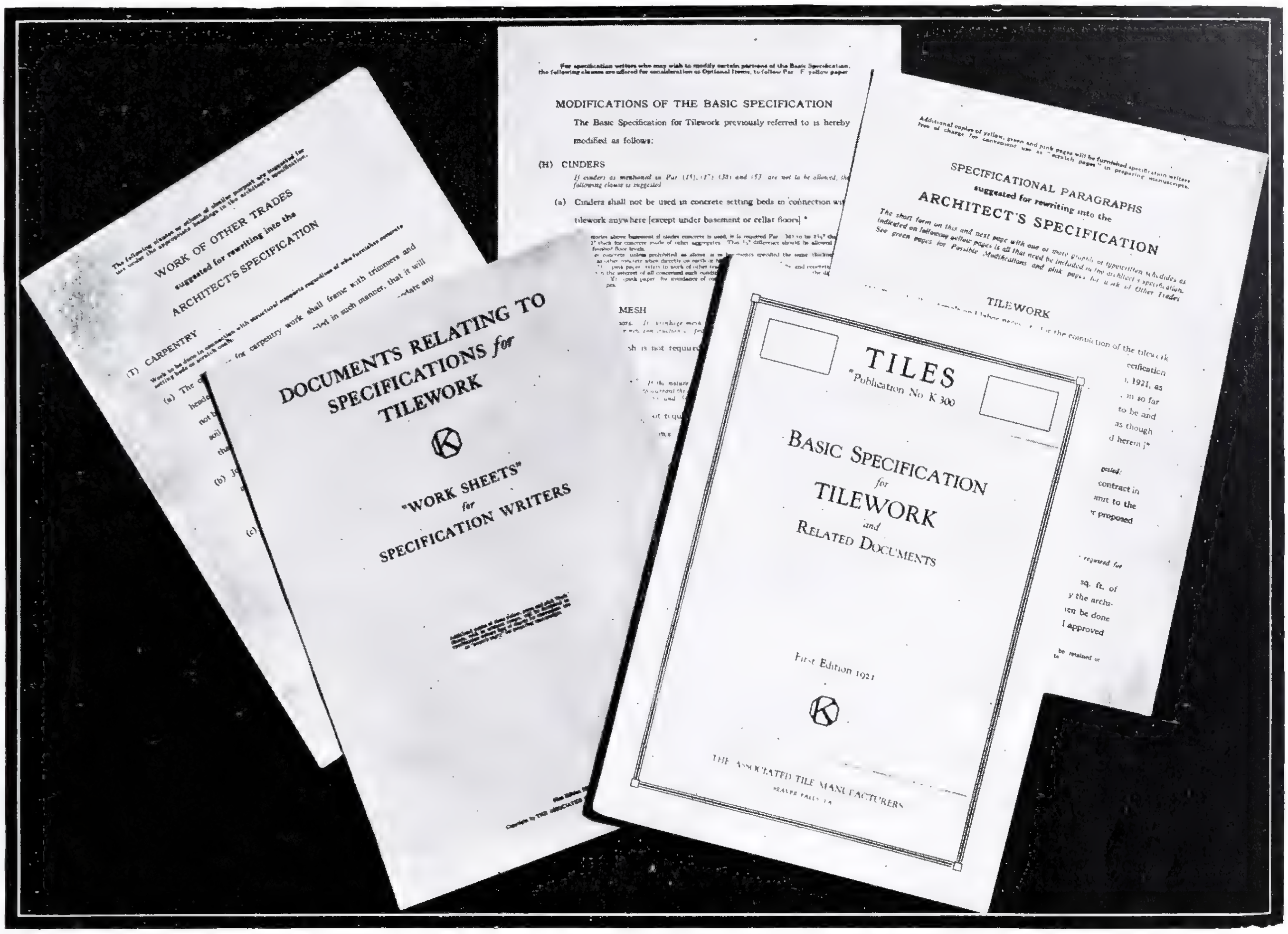
Penna Building

Works: Maurer, New Jersey



The following clauses or others of similar purport are suggested for use under the appropriate headings in the architect's specification.

WORK OF OTHER TRADES
suggested for rewriting into the
ARCHITECT'S SPECIFICATION

(T) CARPENTRY

For specification writers who may wish to modify certain portions of the Basic Specification, the following clauses are offered for consideration as Optional Items, to follow Par F yellow paper

MODIFICATIONS OF THE BASIC SPECIFICATION

The Basic Specification for Tilework previously referred to is hereby modified as follows:

(H) CINDERS

If cinders as mentioned in Par (15), (17) (31) and (53) are not to be allowed, the following clause is suggested

(a) Cinders shall not be used in concrete setting beds in connection with tilework anywhere [except under basement or cellar floors] *

MESH

DOCUMENTS RELATING TO
SPECIFICATIONS *for*
TILEWORK

"WORK SHEETS"
for
SPECIFICATION WRITERS

Additional copies of yellow, green and pink pages will be furnished specification writers free of charge for convenient use as "scratch pages" in preparing manuscripts.

SPECIFICATIONAL PARAGRAPHS
suggested for rewriting into the
ARCHITECT'S SPECIFICATION

The short form on this and next page with one or more graphs of typewritten schedules as indicated on following yellow pages is all that need be included in the architect's specification. See green pages for Possible Modifications and pink pages for work of Other Trades

TILEWORK

TILES
"Publication No K 300

BASIC SPECIFICATION
for
TILEWORK
and
RELATED DOCUMENTS

First Edition 1921

THE ASSOCIATED TILE MANUFACTURERS
BEAVER FALLS, PA.

What the "Basic Specification"

Means to Architects

OUR publication No. K-300—"Basic Specification and Related Documents"—covers a complete Tile installation in what might be termed a composite structure with various features of construction and equipment.

Such a structure might be a small residence or a large office building, a swimming pool or a subway.

It might contain, in addition to the usual interior Tilework, such exterior items as porches, terraces and steps, entrances, street fronts and pavements.

It might be a building or other structure with Tiled floors over earth or fills in basements or on platforms. The work might also include alterations and additions to existing structures as well as new construction.

Uncertainty need no longer exist as to whether and how the carpenter, mason, roofer and other contractors should prepare their work to receive Tilework.

A copy of the complete publication, including "work sheets," will be sent to architects upon request. Additional copies of "work sheets" or "scratch pages," comprising the related documents, will be furnished to the extent desired.

The Associated Tile Manufacturers
Beaver Falls, Pa.

The BILTIN

China
Bathroom
Accessories
(Patented)

QUALITY EQUIPMENT

FAIRFACTS BATHROOM ACCESSORIES are specified regularly by many distinguished architects and are in use now in many of the finest homes in this and other countries. The various fixtures are designed to meet every requirement of good taste.

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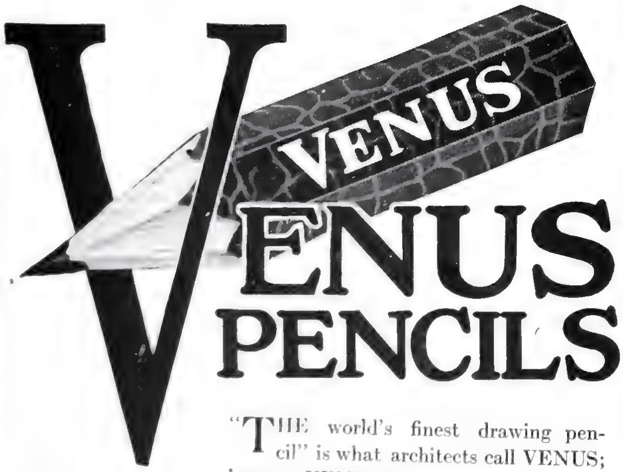
11 East 36th Street, New York
Offices in the Principal Cities
Telephone Vanderbilt 9636 and 7



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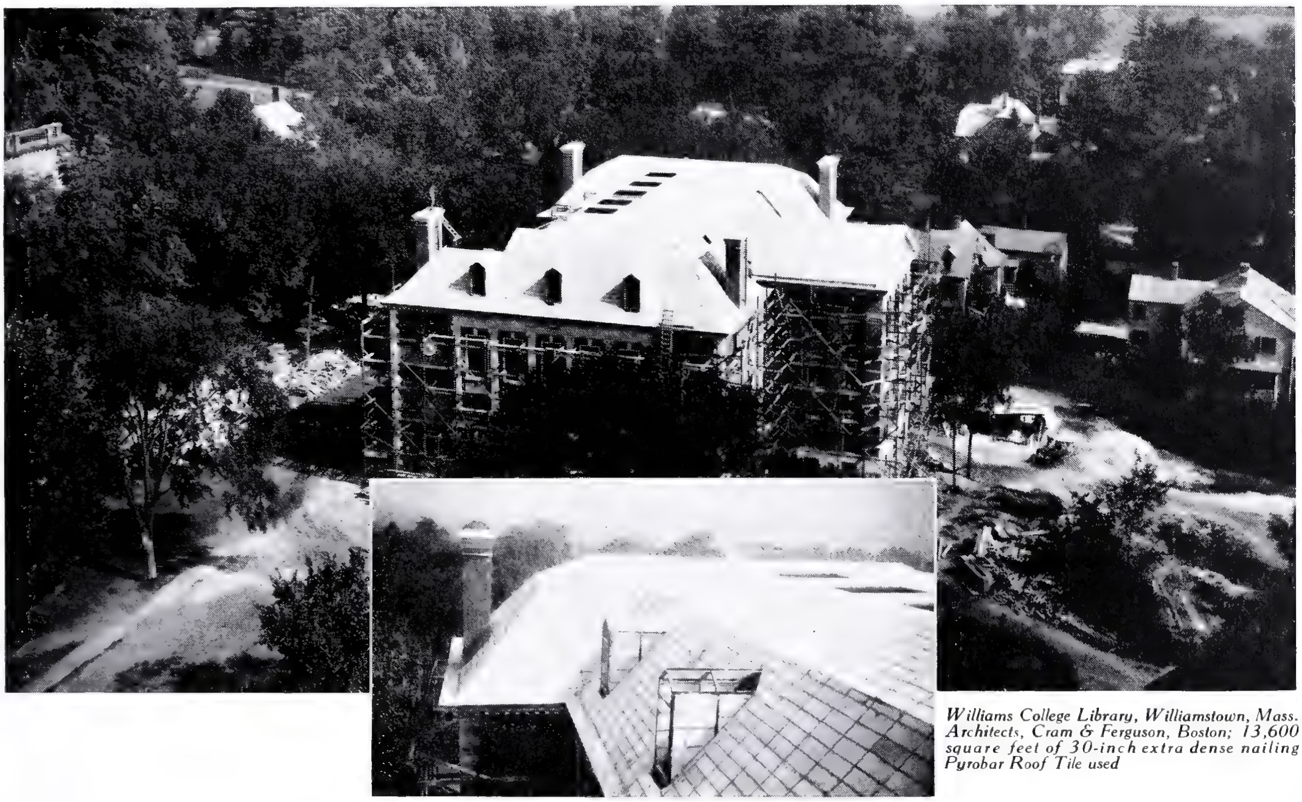

Williams College Library, Williamstown, Mass. Architects, Cram & Ferguson, Boston; 13,600 square feet of 30-inch extra dense nailing Pyrobar Roof Tile used

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Are Easily Erected on Intricate Roof Construction

Pyrobar Roof Tile have made it possible to use ornamental roofs with economy on fireproof buildings.

Pyrobar Roof Tile are light in weight and do not require heavy framing. They are adaptable to roofs of any pitch and are easily and quickly erected. They are fireproof, permanent and low in cost. Tile or slate can be nailed directly to Pyrobar Roof Tile.

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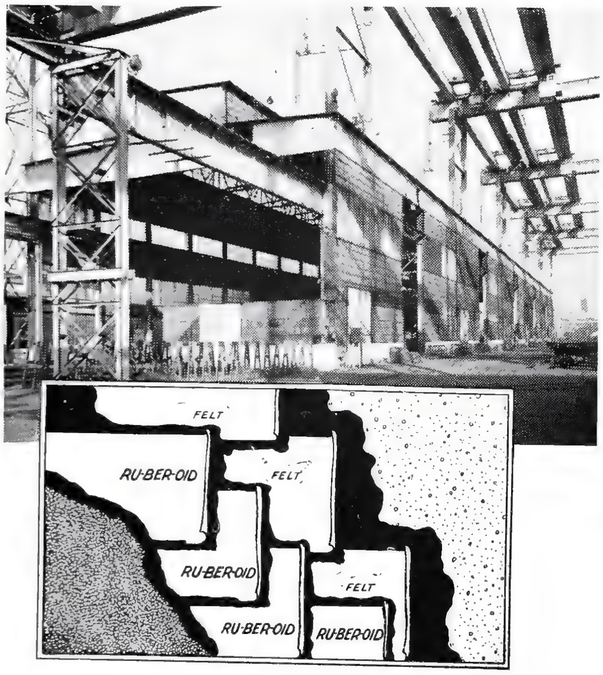

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The Sun Shipbuilding Company put on 1700 squares of Ruberoid Built-up Roof in July, 1917.

Here is what they say about it: "The roof has been very satisfactory. It meets our conditions better than any other that we have had."

That shows what Ruberoid *is* doing.

Why lay an ordinary tar and gravel roof requiring five layers when a Ruberoid Built-up Roof with but three layers will give you a roof for a lifetime?

Furthermore, Ruberoid Built-up Roofs are laid with Ruberoid Roofing, thus possessing the advantage of a mechanically perfect weathering surface. This permits a saving of 40% in fabric area, which means a substantial saving in the cost of application.

When you consider that in thousands of instances a single layer of Ruberoid has actually lasted without repair for more than twenty years, you know what to expect from a Ruberoid Built-up Roof that is composed of two layers of Ruberoid Roofing, in addition to a bottom layer of felt, all bonded together with Ruberoid Solid Bitumen.

A Ruberoid Built-up Roof is given Class "A" rating by the Fire Underwriters' Laboratories, Inc.

Specifications, samples and descriptive literature will be gladly furnished upon request.

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Chicago 95 MADISON AVENUE, NEW YORK Boston

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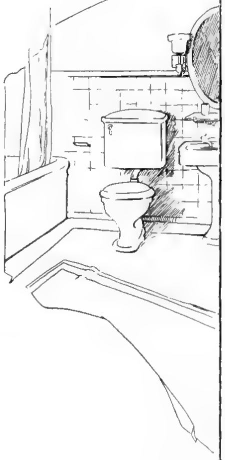
BUILT-UP ROOFS

THE ONLIWON HYGIENE

REGISTERED U.S. PATENT OFFICE



Set-in Tile Cabinet for Toilet Paper

gives an air of distinction to the tiled bathroom. It replaces a 3" x 6" or 6" x 6" tile and comes flush with the surface of the wall.

This cabinet holds 500 interfolded sheets of satin-finished tissue which it serves consecutively—*just two sheets at a time.*

Send for Complete Specification Card explaining Set-in Tile and other ONLIWON Cabinets.

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Department F
ALBANY, N. Y.

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Albany Park Presbyterian Church, Chicago
Pond & Pond, *Architects*

T-M-B FLOORING THE Mastic Floor

Churches represent another type of structure for which T-M-B Flooring is particularly adapted.

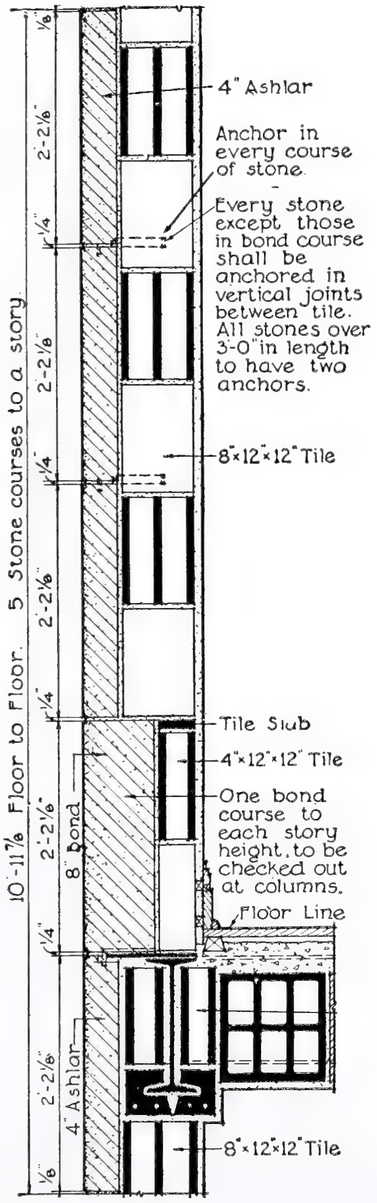
The Albany Park Presbyterian Church, with T-M-B Flooring in the Sunday school rooms, corridors and retiring rooms, is one of a number of such edifices receiving excellent satisfaction from this flooring.

Let us explain its suitability for your various commissions. Write Dept. 2.

THOS. MOULDING BRICK CO.

133 W. Washington St. CHICAGO

The Advantages of Hollow Tile as a Backing Material


4" Ashlar
Anchor in every course of stone.
Every stone except those in bond course shall be anchored in vertical joints between tile. All stones over 3-0" in length to have two anchors.
8"×12"×12" Tile
Tile Slab
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2'-2 1/8"
1/4
2'-2 1/8"
1/4
2'-2 1/8"
1/4
2'-2 1/8"
1/4
2'-2 1/8"
1/8
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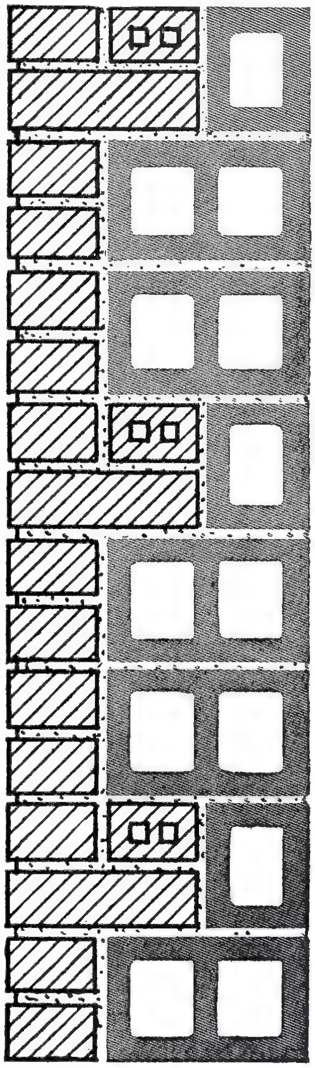

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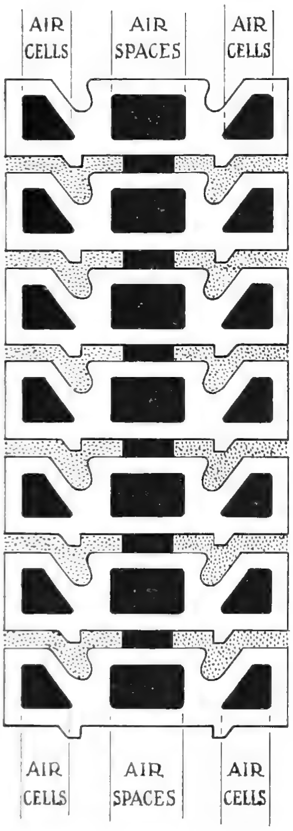

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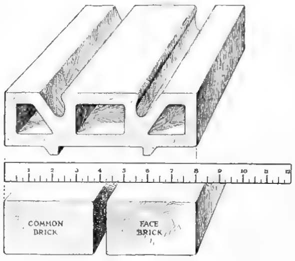

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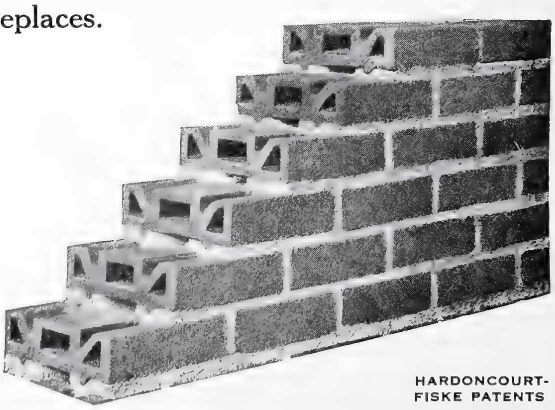

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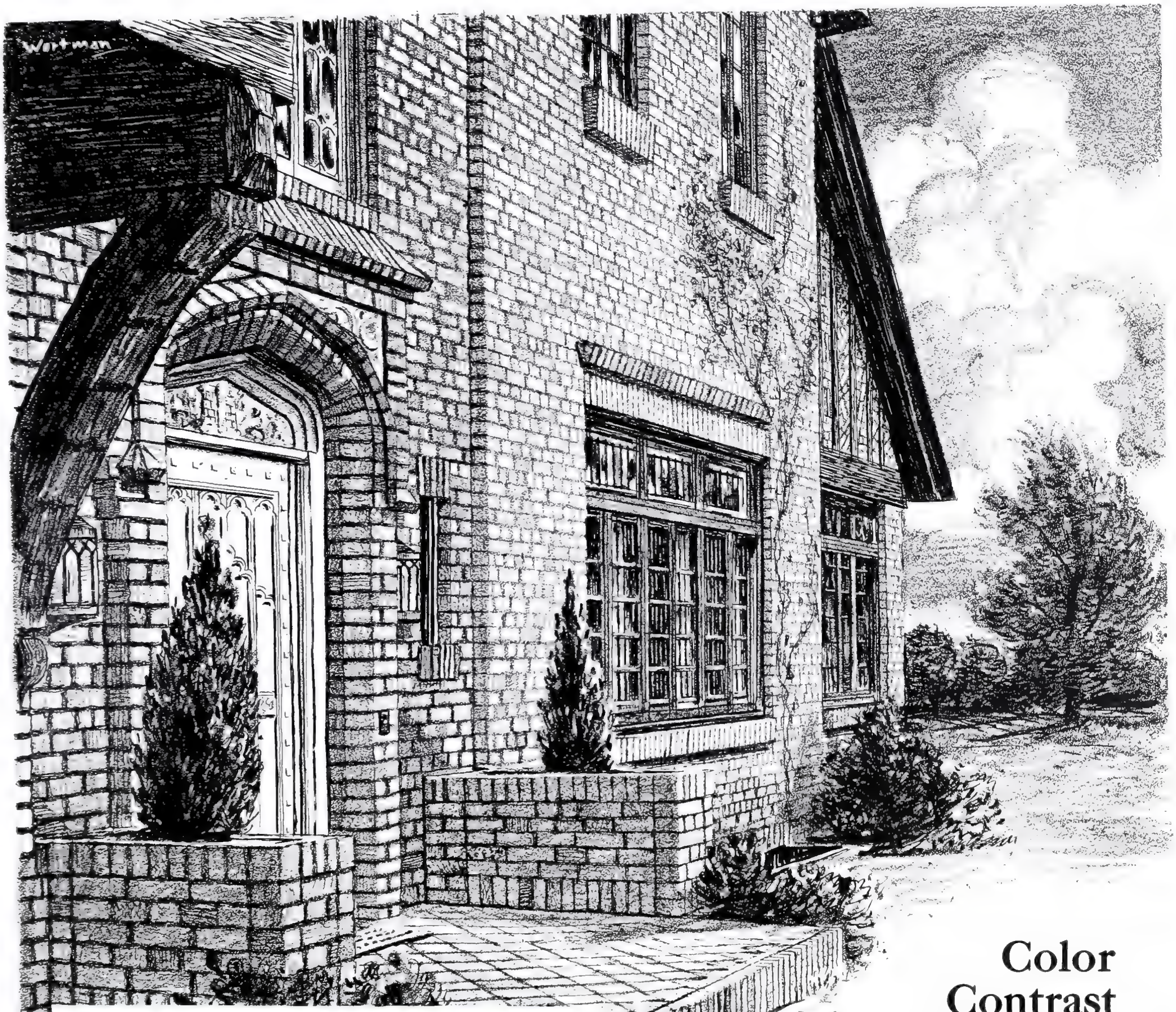

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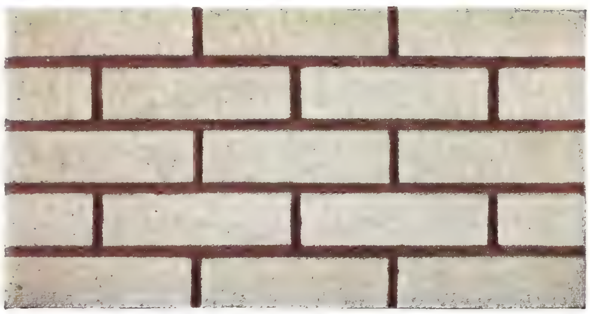

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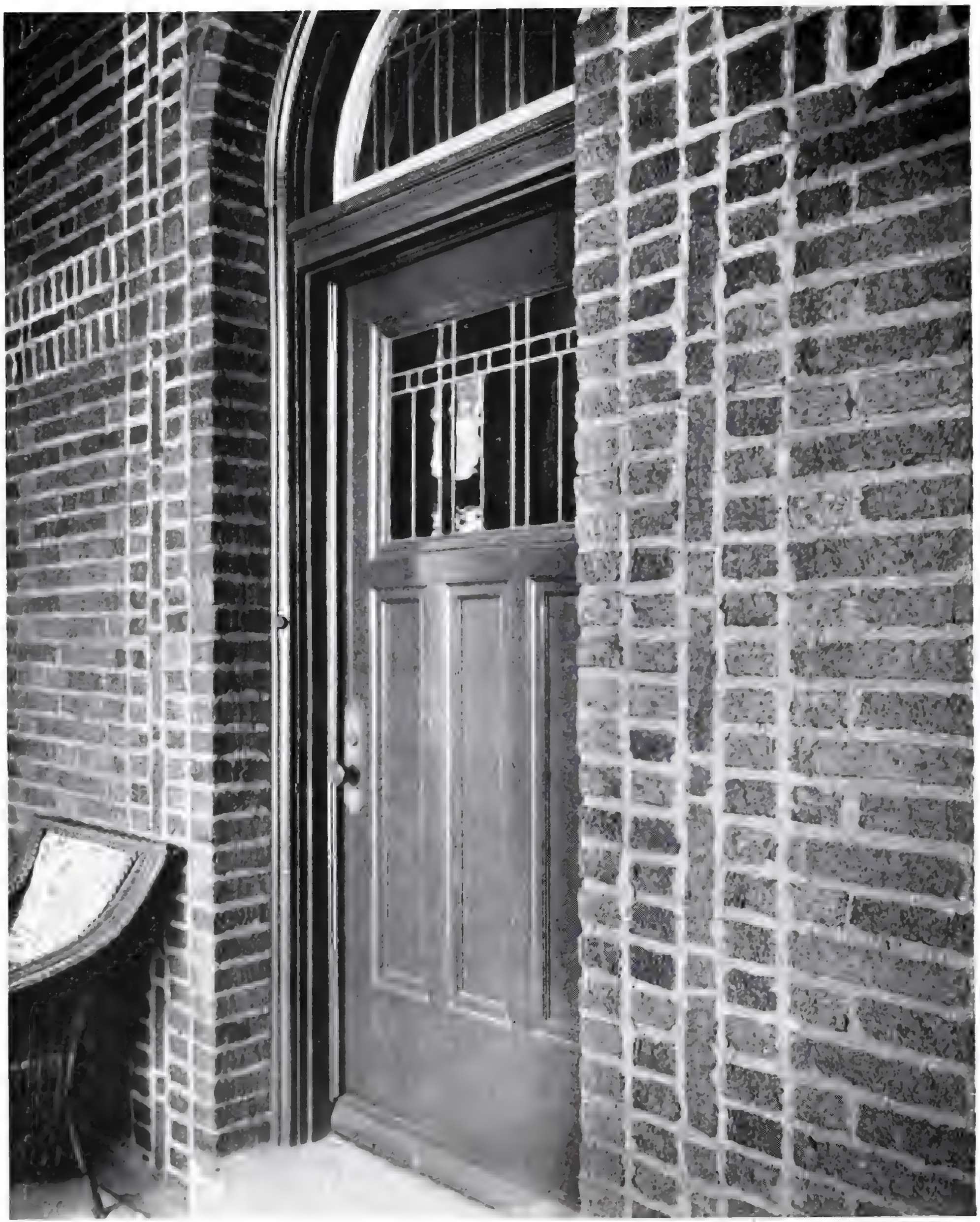

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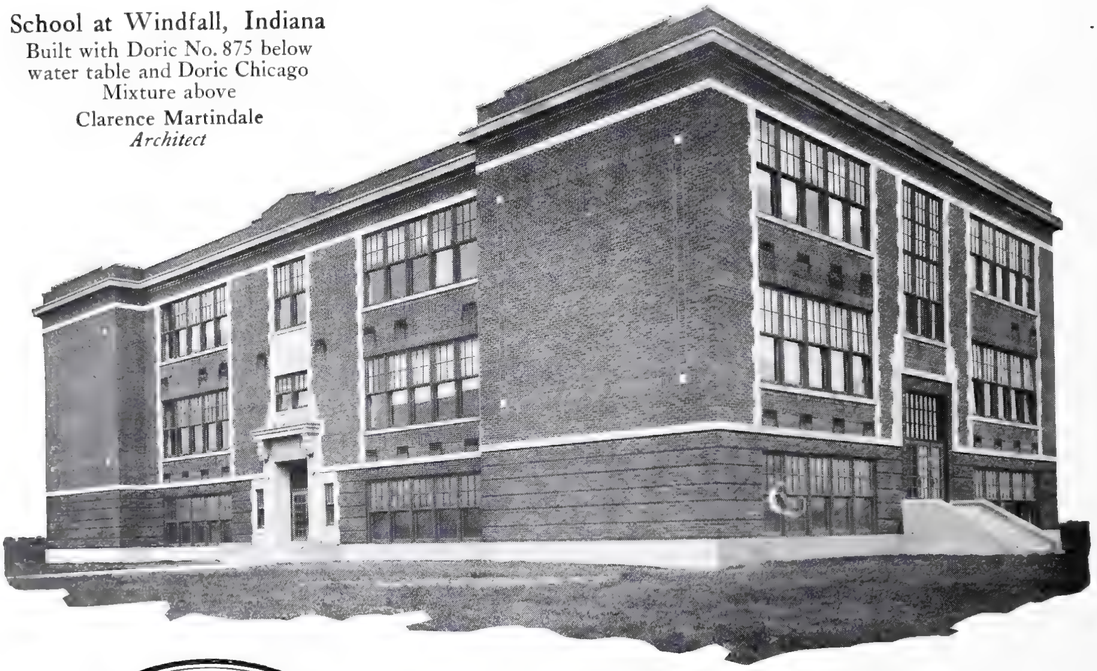

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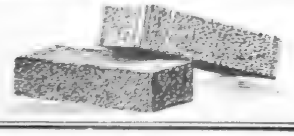

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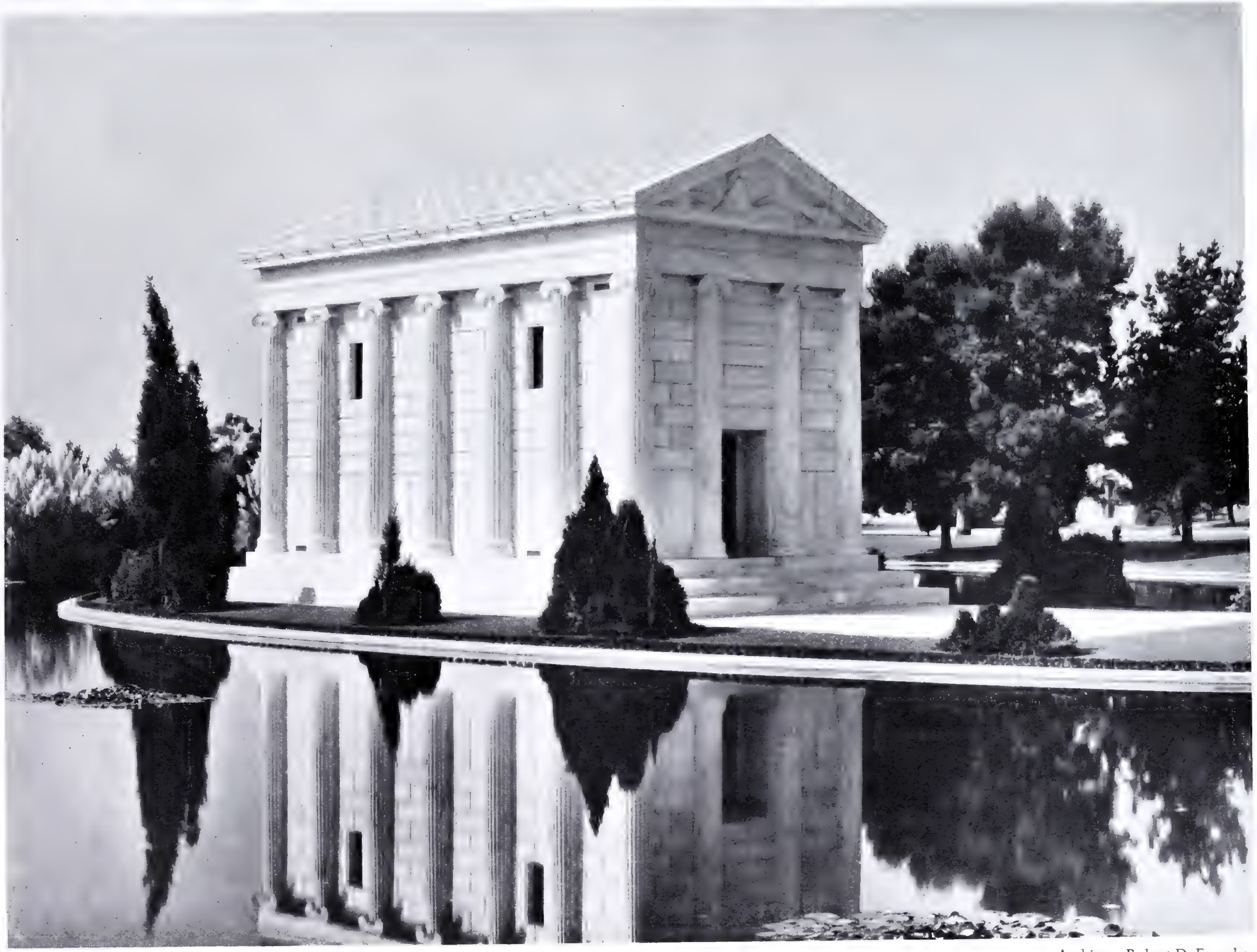

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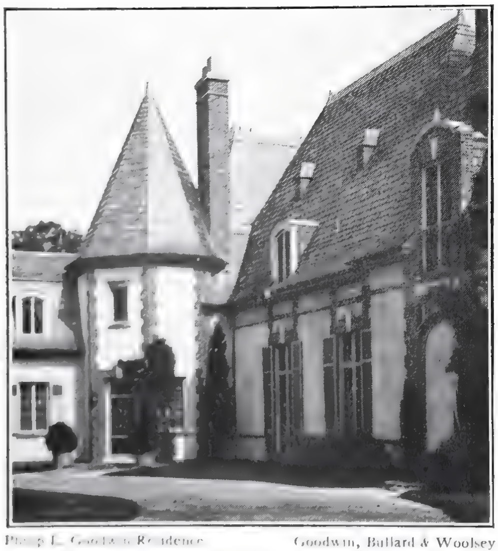

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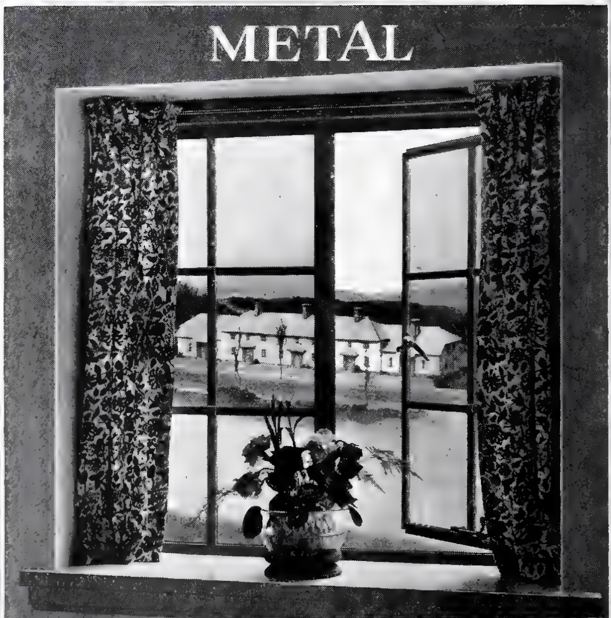

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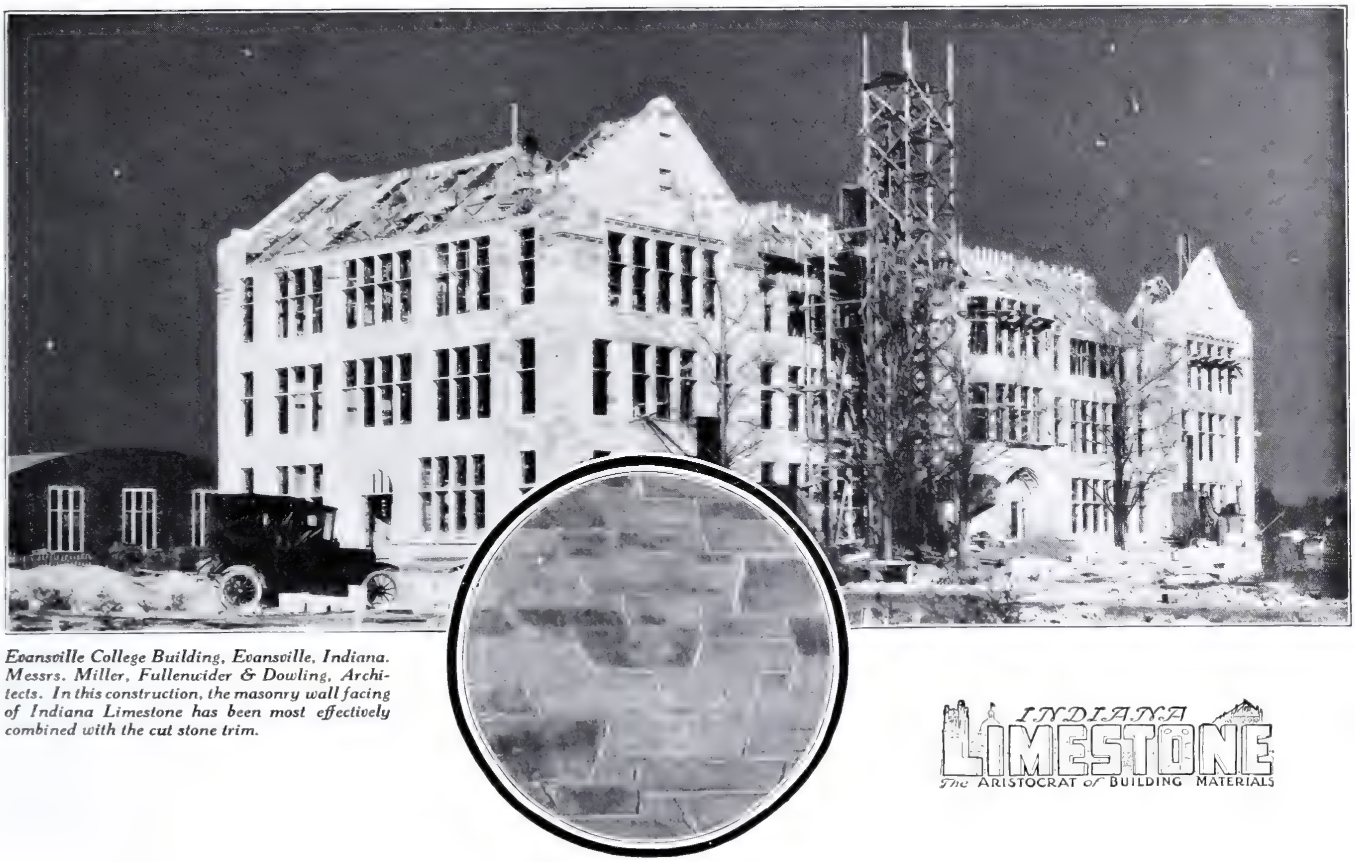

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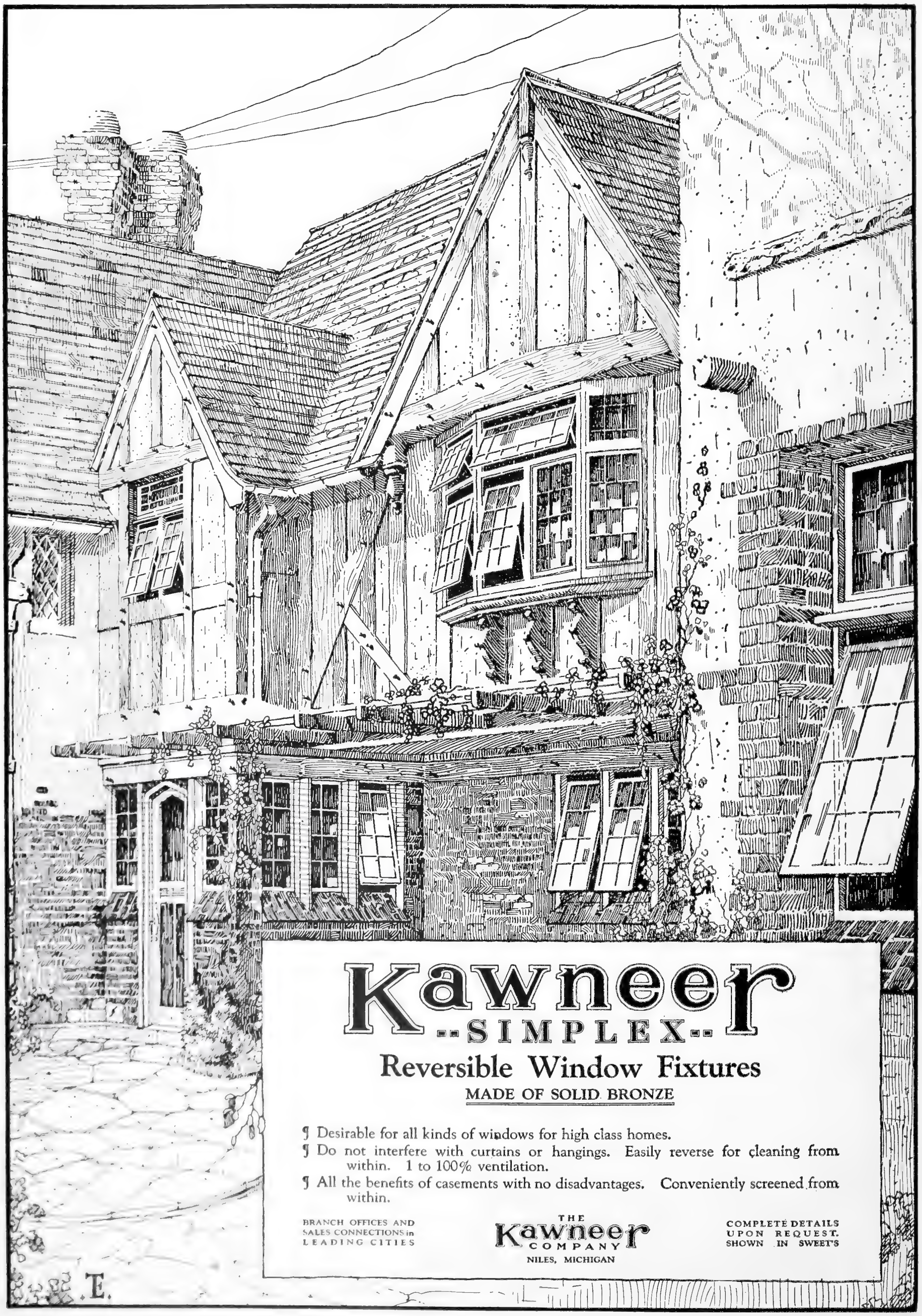

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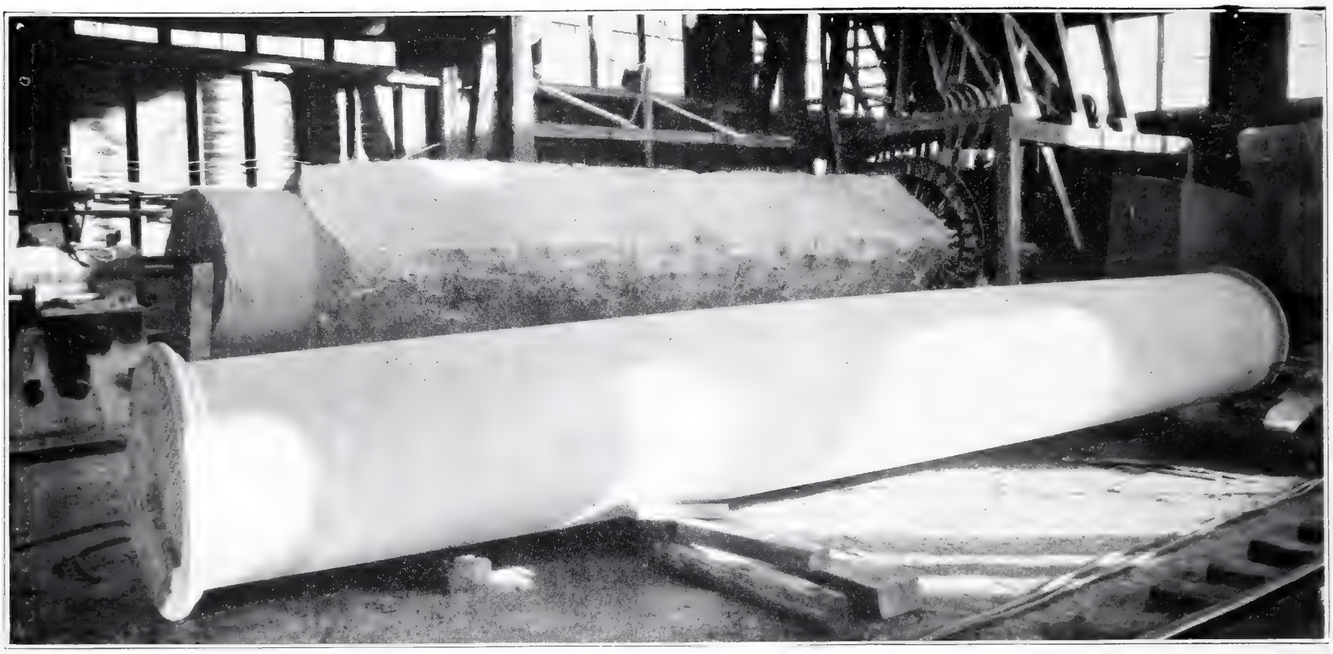

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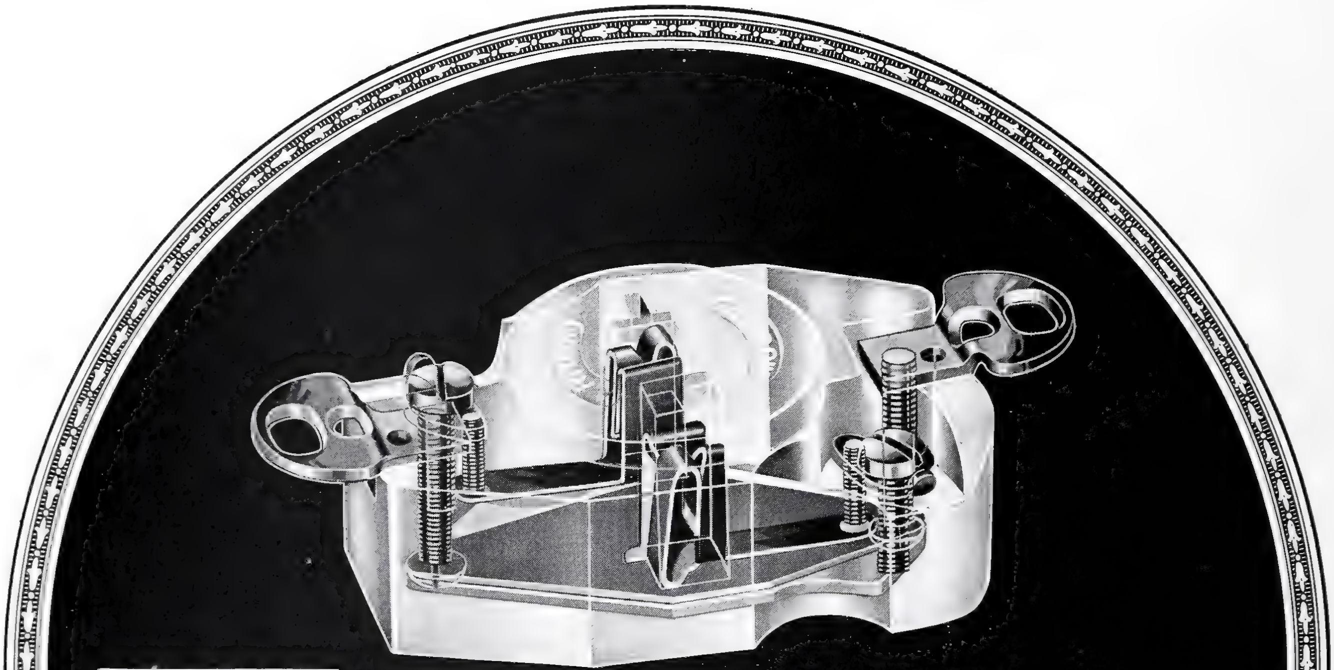

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BOOK DEPARTMENT

"Ad Quadratum"

REVIEWED BY WOLDEMAR H. RITTER

AD QUADRATUM. A Study of the Geometrical Bases of Classical and Mediaeval Religious Architecture. By Fredrik Macody Lund. Profusely illustrated by plans, sections, views and details of notable temples, churches, cathedrals and other buildings in Greece, Italy, Germany, Denmark, France, England and Norway. Printed by order of the Norwegian Parliament. Published by B. T. Batsford, London. 2 vols. 9¾ x 12¾ ins. Price £5 net.

MODERN architecture is deeply indebted to the parliament of Norway for the publication of "Ad Quadratum," the work of an author, historian and art critic of international reputation. The book is an elucidation of architectural philosophy, called forth by the controversy waged over the reconstruction of the cathedral of Nidaros, Norway's national shrine. Fearing lest the proposed reconstruction result in one of the usual modern abortions, Prof. Lund made an exhaustive study of those parts of the cathedral still standing, in the course of which he discovered certain striking mathematical proportions, the existence of which he has since found repeated in the ecclesiastical architecture of all ages.

It still is fashionable for architects to "sit in the seats of the scornful," and smile at any attempt to produce architectural beauty by geometrical means, but books like "Ad Quadratum" foreshadow the time when these seats will have to be vacated, and perhaps more precipitately than gracefully! Dissecting temples and cathedrals like a comparative anatomist, Prof. Lund has laid bare a common skeleton plan, based on series of squares, cubes and pentagons, uniting all ecclesiastical architecture from Solomon's temple on, into one great family of "Quadrata."

For centuries mankind has stood in awe before the temples and cathedrals of earlier ages, while criticism vanished in the worship of beauty. Although architects of our time have done their best to live up to classic tradition, they have succeeded only in the details. Every honest critic is sensible of the lack, and the greatest architectural minds of the last century have occupied themselves with the reason for this failure, striving for the rediscovery of the scientific basis of the art of architecture. The few architectural drawings handed down from the middle ages and the scanty documents of the building guilds merely hint at geometric methods of design, either because the philosophy symbolized by their designs was a guild secret, or a knowledge of it was assumed to be the common property of all builders.

In "Ad Quadratum" Prof. Lund claims to have rediscovered this philosophy and the geometrical principles underlying its expression in architecture. Whether he has given us the final word, the future alone can decide, but there can be no doubt that he has directed a powerful searchlight upon the middle ages.

The diagrams are elaborately worked out. The author does not stop with squares and diagonals, as do his predecessors in this field, but considers the pentagon and pentagram most important construction figures, and his numerous drawings are covered with these to such an extent that he can say, "When the pious mediæval worshiper stepped inside the porches of the transept, or followed the long processions through the nave porch, he came into a wonderful world of imaginary pentagrams, around the altar, in the sanctuary, high up between the spires, and over the roof of the church where chancel and church meet—the symbol of creation and of the miracle of life in ancient and Christian times." (p. 76.) But he goes further. In the chapter on the "Sectio Aurea" he gives us one of the most interesting compilations of the many early statements of this remarkable law and an exhaustive history of its origin and application to classic buildings.

Prof. Lund regards ecclesiastical architecture, from the Temple of Solomon on through Greek temples and mediæval cathedrals, as the architectural expression of the Greco-mediæval philosophy of the harmony and beauty of the universe, embodied in mathematical laws and symbols. Armed with this theory not only has he conquered his opponents and saved Norway's

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national shrine from being reborn a monstrosity, but to quote his own words has "sent back to its proper place, to darkness and chaos" the modern view of art which "turns architecture into a matter of feelings,—a mixture of sentimentality and stupidity."

The architect who, to any degree whatever, endeavors to infuse beauty along with utility into his work, cannot afford to neglect the study of the principles of proportion laid down in this book and its predecessors. As the carpenter's knowledge need go little beyond the square and triangle, so many an architect may be satisfied with using the simple fundamental principles elucidated in "Ad Quadratum," but the man of culture and learning will find here a wealth of thought, the digestion and application of which he will recognize as one of his duties. Prof. Lund is an exponent of higher mathematics; his exposition will appeal chiefly to the trained philosophical mind. What is now needed is a masterly version of "Ad Quadratum" in "words of one syllable."

ITALIAN RENAISSANCE FURNITURE. By Wilhelm von Bode, translated by Mary E. Herrick. 47 pp. and 134 illustrations. 7½ x 10 ins. Price $4. William Helburn, Inc., 418 Madison avenue, New York.

THE popular and increasing interest in Italian renaissance architecture, and the furnishings which the architects and craftsmen of the times designed to go with it, owes much of its growth to various books upon the subject. In 1902 Dr. Wilhelm von Bode published the original edition of which the volume here reviewed is a reprint, made necessary, as the author observes in the introduction, by "the lively interest in Italian furniture."

More than is true of furniture of some of the great periods, that of the Italian renaissance depends for its effectiveness largely upon the character of its surroundings. The architects of the period possessed a marvelous understanding of the relations between movable objects and the walls, ceilings and other details which made up the setting, so that it is impossible to study intelligently the furniture of the renaissance without studying as well the interior architecture which went with it, and while this volume is concerned chiefly with furniture enough is said of interior architecture to give the student a fair grasp of the subject.

Dr. von Bode makes it plain that each of the large cities of Italy possessed its own local version of the renaissance, each version holding its particular interest for the architect or decorator, though the differences are subtle and might easily be overlooked by the unobserving. These variations of style or type were especially marked in the development of the table and the cassone or chest, also in the different forms which were given the chair.

The formation of a trained and accurate taste in period furniture depends mainly upon two things,—study of authentic pieces of the time, which in this day of museums and private collections is within the reach of many, and study also of authoritative works upon the subject which may even more readily be seen at most of the libraries. But each student will find that a collection of photographs and illustrations from magazines is a powerful aid in obtaining a matured and settled view of the subject, and securing this view is further helped by the possession of books upon the topic.

ARCHITECTURAL RENDERING IN WASH. By H. Van Buren Magonigle, F.A.I.A. 160 pp., illustrated. 7½ x 10 ins. Price $5. Charles Scribner's Sons, New York.

THE reading of this book may not make a genius in the way of a producer of renderings out of an architectural draftsman, but we venture the assertion that a study of its contents and an application of its precepts will go far toward accomplishing that desirable end. As Mr. Thomas R. Kimball observes in the preface, this book presents its author in the diverse capacities of architect, draftsman, painter and writer, of whose work the architectural draftsman will be the chief beneficiary, though posterity will also share in these benefits in that because of the book impetus may be given which will strengthen and foster what might otherwise become one of the lost arts.

Mr. Magonigle says that the work is written from the point of view of a beginner who knows little about rendering but who wants to find out. With this in view the book takes up the teaching of rendering at the very beginning and through eight chapters follows the subject, covering the various phases of medium and technique. The making of rendered drawings is not work which is likely to be attempted by a novice at drafting, but a student who has attained to a proficiency which would inspire a desire to undertake rendering would unquestionably be able to draw considerable valuable help from Mr. Magonigle's pages.

As an example of what a well executed rendering should be and also to establish a high mark toward which the student should aim, the book includes reproductions of 22 renderings—one in color—by the author, Paul Philippe Cret, Hubert G. Ripley, Jules Guerin, Otto R. Eggers, Ernest Piexotto and a number of others. Probably a renderer like a poet may have to be born and not made, but even a poet must learn the grammar of the language which is to be his medium and in much the same way this work may be regarded as the grammar or textbook of the art of producing rendered architectural drawings.

A STUDY OF THE EFFECT OF MOISTURE CONTENT UPON THE EXPANSION AND CONTRACTION OF PLAIN AND REINFORCED CONCRETE. By Torato Matsumoto. Bulletin No. 126. Published by the Engineering Experiment Station, University of Illinois, Urbana, Ill.

THE investigations of the properties of concrete hitherto conducted have had to do chiefly with its strength, but closely related to the strength of concrete are the effects produced upon it by moisture and changes of temperature. Reinforced concrete has practically the same coefficient of expansion as steel where temperature changes are concerned, so that the two materials contract or expand together, but moisture has no effect upon steel. Unlike steel, concrete expands when it absorbs moisture, much like clay, wood or certain other substances.

This study into the effect of these conditions upon concrete is the work of an engineer engaged in the construction of harbor works on the island of Formosa. Owing to the conditions which prevail in this tropical region the durability of a substance exposed to the sea air and to constant climatic changes is a matter of much importance, and the result of the investigations recorded in this Bulletin have an application as wide as the constantly broadening sphere of concrete's use. Copies of this Bulletin may be had without charge.

Small Houses of the Late Georgian Period

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A volume on the small country or suburban houses and town houses, detached or in rows, of the late eighteenth century type, suitable for American use today. The houses shown include those of stone, brick, stucco or clapboards and most of them are designed in the dignified, slightly formal style which marks the Georgian period; some of the buildings contain shops on the ground floors with living quarters above. The volume also contains illustrations of doorways, porticoes, balconies and wrought ironwork of the time.

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THE PRESENT STATE OF OLD ENGLISH FURNITURE. By R. W. Symonds. 132 pp., 156 illustrations. 10 x 12 ins. Price $20. Frederick A. Stokes Co., New York.

THE architect or decorator interested in the use of old English furniture will derive almost as much benefit from this work as the collector, for whose use it is primarily intended. The golden age of English furniture was that which covered the sixteenth, seventeenth and eighteenth centuries; little furniture is apt to be found made prior to that period, while soon after 1800 furniture making, together with most of the arts involving taste in design, fell to a low level.

From the point of view of one who has made a long study of English furniture are written the chapters relating to color and patina, design and ornament, workmanship, present condition and restoration. The author's treatment of the subject is divided broadly into divisions in which are discussed the uses of oak, walnut and mahogany. The use of gesso for forming the foundations upon which gold was applied during the Georgian period is dealt with, and in connection with gold furniture Mr. Symonds touches upon the work of William Kent and a few other architects of his school, and as is necessary in any book treating of furniture which is closely related to the customs of its times, this volume makes more or less reference to the history of the period and to the decorations and accessories which were in use.

COLLECTED PAPERS ON ACOUSTICS. By Wallace Clement Sabine. 279 pp., 7½ x 10½ ins. Price $4. Harvard University Press, Cambridge, Mass.

INTO this volume have been gathered many of the papers upon the subject of acoustics which were written by the late Prof. Sabine for various architectural journals, together with other articles hitherto unpublished. Unless an architect has been confronted with a problem which involves the assured provision of certain acoustical properties he can have but little idea of the difficulty of planning to insure these required results. The science of acoustics has not yet reached a stage of development which would entitle it to rank with the sciences known as "exact," and unfortunately the acoustical properties of a building cannot always be judged until the structure is completed, furnished, and in some instances even occupied by an audience. It is always easier to explain why a method does not work than to know in advance whether it will or will not, and it is especially easy to explain why it does not work when one is not under the immediate necessity of correcting it or supplying it. To add to the difficulty of insuring proper acoustics, there are constant changes in the use of materials employed for building, fireproofing, ventilating, etc., and introduction of new materials the acoustic properties of which are generally an unknown quantity.

The author deals thoroughly with this complicated subject, treating at considerable length such of its divisions as Absorbing Power of Wall Surfaces, Fabrics, Cushions and Floor Coverings; Absorbing Power of Audiences; Reverberation; Effect on Acoustics of Required Seating Capacities; Effects of Air Currents and Temperatures; Correction of Acoustical Defects in Existing Buildings, and a valuable section is that on Insulation of Sound, which is important in buildings of many kinds.

The science of acoustics has been considerably developed during recent years, the late Prof. Sabine himself being one of its most successful exponents, and this work places in a form permanent and readily accessible the result of his researches and investigations.

HOUSE & GARDEN'S BOOK OF HOUSES. Edited by Richardson Wright. 110 pp., 9¾ x 12¼ ins. Price $3. Condé Nast & Company, New York.

HOUSES of every type popular in suburbs or country are represented in this book which contains more than 300 illustrations of homes, large and small, plans, and views of service quarters, garages, and such important architectural details as doorways, fireplaces, windows, floors, walls, ceilings, closets, stairways, chimneys, etc. The book is arranged in three general divisions which include (1) the houses themselves, (2) exterior and interior architectural details, with views and the requisite plans, and (3) the arrangement of garages, service quarters and accessory buildings of different sorts, considered in their relations to the place as a whole.

One of the most powerful aids in visualizing the home is to see what others have done elsewhere and to obtain an idea of the possibilities held forth by each of the various house types. A prospective builder in country or suburb who is weighing the relative merits of different types of houses and the materials of which they may be built would find himself repaid many times over for the amount of money he might invest in a book such as this. With but a few exceptions the houses illustrated are of what is generally known as "average" or "moderate" cost. It is not difficult to secure results in building and furnishing when lavish expenditure is possible, but often the most interesting houses are those worked out under the handicap of a limited appropriation.

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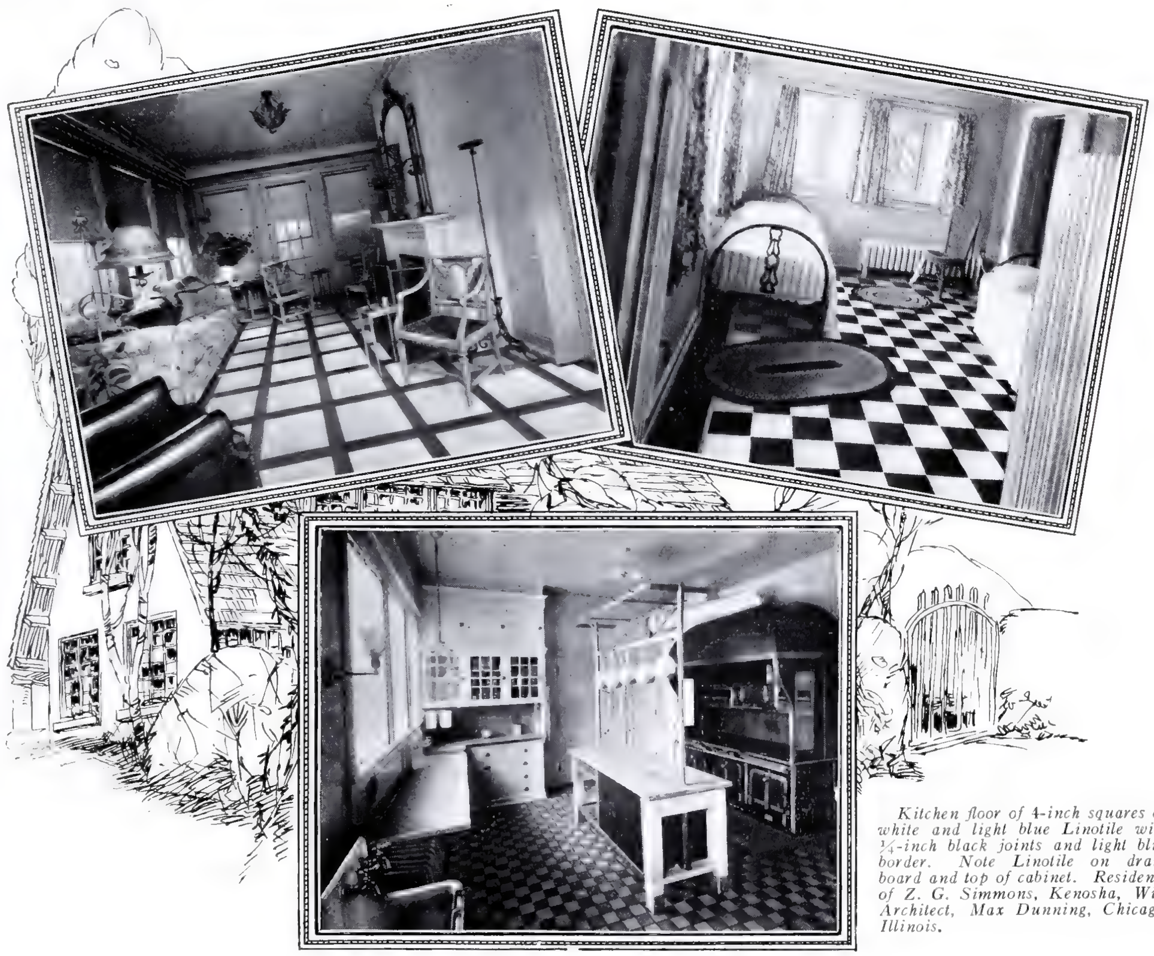

The Linotile floor in this sunroom is made up of 16-inch white squares separated by 4-inch light blue strips with a light blue border. Residence of J. W. Dyar, Grosse Point, Detroit, Mich. Architect, Geo. W. Graves, Detroit, Mich.

Sleeping porch floored with 8-inch squares of black and white Linotile with light gray and black border. Residence of L. W. Reps, Springfield, Mo. Hawkins & Hoener, Architects.

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THE ARCHITECTURAL FORUM

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Published Monthly by
ROGERS AND MANSON COMPANY
142 Berkeley Street, Boston 17, Mass.
Advertising Department, 103 Park Avenue, New York
Yearly Subscription, payable in advance, U.S.A., Insular Possessions and Cuba, $6.00
Canada .... $6.75 Foreign Countries in the Postal Union, 7.50
Single Copies .... 60 cents All Copies Mailed Flat
Trade Supplied by American News Company and its Branches. Entered as Second Class Matter, March 12, 1892, at the Post Office at Boston, Mass.

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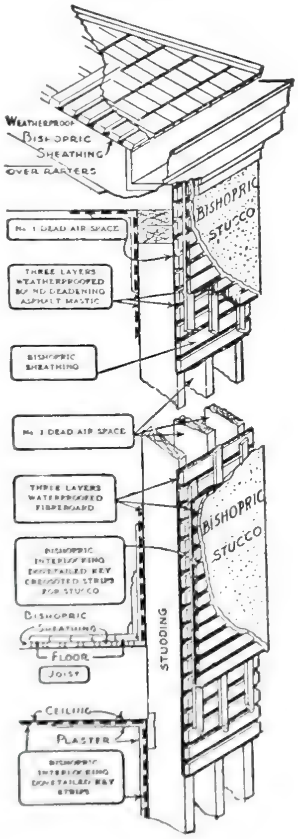

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THE EDITOR'S FORUM

ENFORCEMENT OF JURISDICTIONAL AWARDS

THE Associated General Contractors of America, The American Institute of Architects, The Engineering Council, The National Building Trades Employers Association, and the Building Trades Department of the American Federation of Labor through the National Board of Jurisdictional Awards, which has just concluded its regular quarterly meeting in Washington, have reached a national agreement through a resolution heavily penalizing union workmen who refuse to abide by the decisions of the Board.

This action has been taken as the result of the report of a special committee of the National Board appointed to outline the procedure to be followed in clearing up the situation created by the refusal of the United Brotherhood of Carpenters and Joiners to conform to the decisions of the Board in the case of settling the dispute between the carpenters and the sheet metal workers which was decided in favor of the latter. This dispute involved the setting of sheet metal trim on doors and windows. The carpenters have refused to abide by the decisions and have called strikes and suspended work on big construction jobs in many parts of the country, causing serious trouble and unemployment in other trades.

The resolution follows:

Whereas, The United Brotherhood of Carpenters and Joiners of America has not been observing or conforming to the decisions of the National Board of Jurisdictional Awards in the Building Industry; and

Whereas, The attitude of that organization in failing to observe those decisions is seriously embarrassing owners, architects, engineers, contractors and workmen engaged in the building industry, and such a condition tends to increase costs and to cause delay and is detrimental to the public interest and the building industry in general; and

Whereas, All parties signatory to the plan of the Jurisdictional Board have been actively supporting the decisions of that Board, including sixteen of the seventeen International Unions constituting the Building Trades Department at the inception of the Board;

Resolved, That in order to correct the above mentioned conditions, the several signatories to the plan of this Board be urged to instruct their constituent members, each in its respective field, as follows:

That the members of the American Institute of Architects and of the Federated American Engineering Societies insert in all specifications and contracts for building operations a stipulation that the decisions of the Jurisdictional Board be observed;

That the members of the Associated General Contractors and of the National Association of Building Trades Employers incorporate in their agreements with their sub-contractors a provision that will secure a compliance with all decisions of the Jurisdictional Board and that the members thereof shall refuse employment to any local union or members thereof neglecting or refusing to abide by decisions of the Jurisdictional Board;

That the Building Trades Department shall instruct local councils to unseat any local union refusing compliance with such decisions, and that associated International Unions shall instruct their respective locals to extend neither recognition nor support until such time as delinquent locals accept and abide by all decisions of the Jurisdictional Board;

Resolved further, That this resolution shall be enforced as expeditiously as possible beginning with those localities in which the trouble appears to be most acute and where action seems most urgent, and that all these signatories make special and united efforts toward securing general and complete compliance with all the decisions of the Jurisdictional Board; and

Resolved also, That as and when trouble in any locality is brought to the attention of any of the signatories such organization shall take the initiative in forming a general committee of representatives from all the signatories for the purpose of dealing with the situation in that locality.

Of the seventeen International Unions that constitute the Building Trades Department of the A. F. of L., sixteen have unqualifiedly endorsed the work of the Board and supported its decisions. The carpenters' union alone, although one of the original organizers of the Board, now refuses to support it.

The purposes of this national board for jurisdictional awards is to settle difficulties between unions over what crafts shall do certain work in the construction industry by orderly and judicial procedure rather than by costly strikes. The metal trim case above referred to was under consideration for nearly a year, during which time both sides were given ample opportunity to be heard.

An important decision also finally settled at the recent meeting of the Board was that of the elevator constructors *vs.* the electrical workers as to which trade should have jurisdiction over the work of hoisting, lowering and placing of elevator machinery. The work was awarded to the elevator constructors.

The portion of the resolutions requiring architects to insert in their specifications a stipulation that the decisions of the Board shall be observed applies only in cases where union labor is employed; architects supervising work erected under open shop conditions are not affected.

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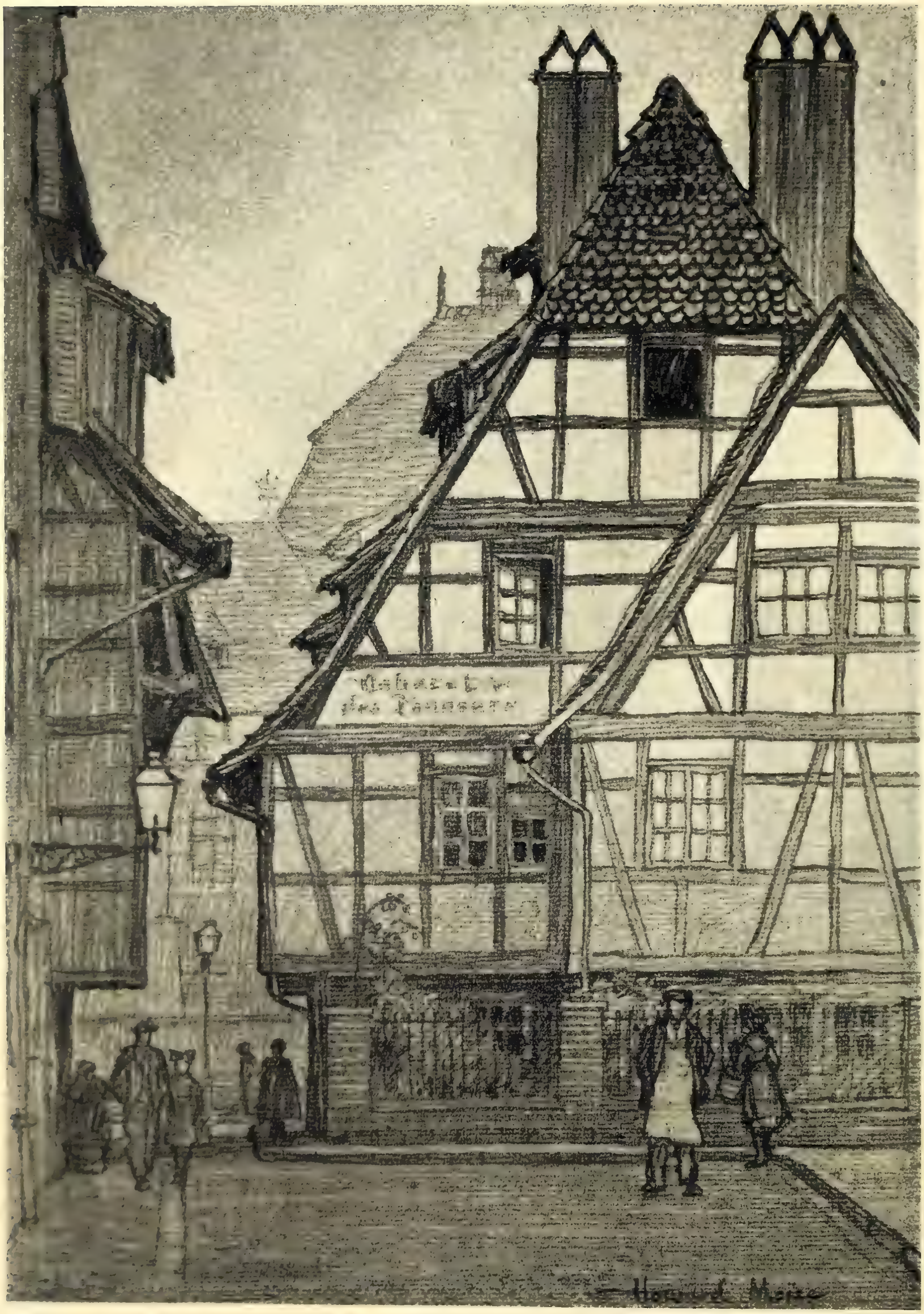

THE CABARET DES TANNEURS, STRASBOURG, ALSACE
FROM THE PENCIL DRAWING BY HOWARD MOÏSE

The
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VOLUME XXXVI APRIL 1922 NUMBER 4

The Fourth Dimension in Schoolhouse Design

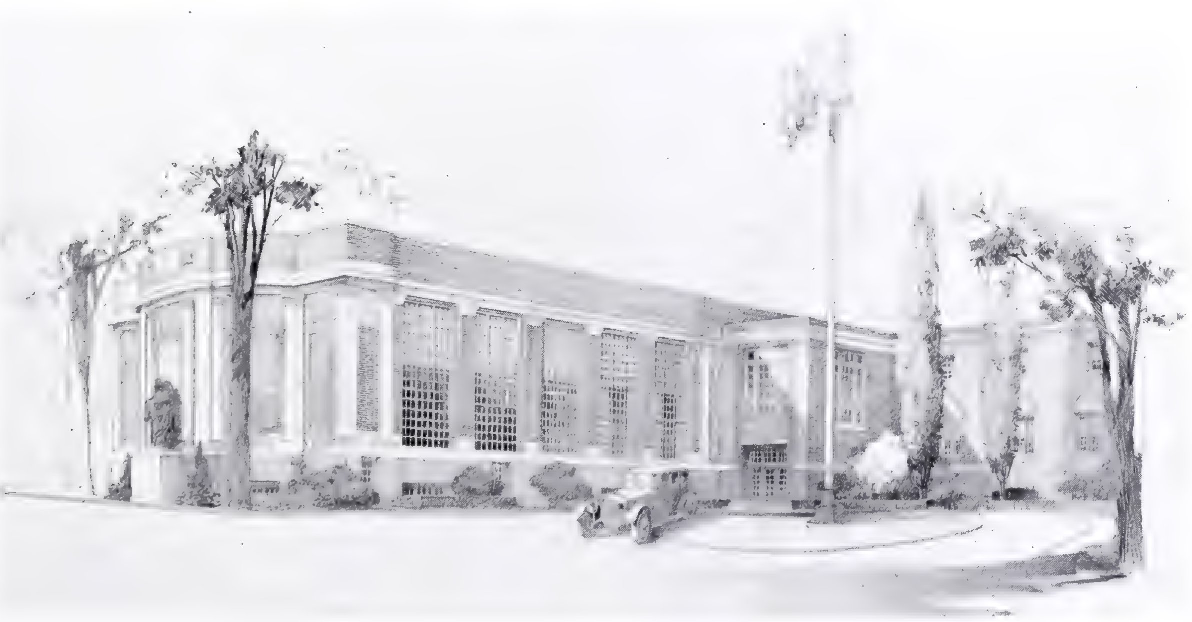
By WILLIAM ROGER GREELEY
Of Kilham, Hopkins & Greeley, Architects

THE cost of construction has decreased during the last two years until today it is again possible to build schoolhouses at something like pre-war prices. Figures received during January on a large, completely fireproof schoolhouse in the vicinity of Boston show a total cost, including work of all trades, of less than 35 cents per cubic foot, as against from 50 to 80 cents for similar buildings two or three years ago.

Construction is just commencing on a contract for a high school in Brookline, fireproof with respect to stair halls, auditorium and corridors, on a basis of about 32 cents per cubic foot. This building, plans of which are shown herewith, is complete in its equipment, and can be taken as an example of thoroughly and carefully studied high school planning. The materials used are the best. All stonework is Indiana limestone, and the brick used is dense and water-struck. The interior is likewise of the best materials. Another very important point is that the plan is open, arranged around a quadrangle or court. Such a building costs more than one with a cramped or congested plan. The moderate cost is therefore in this case very encouraging.

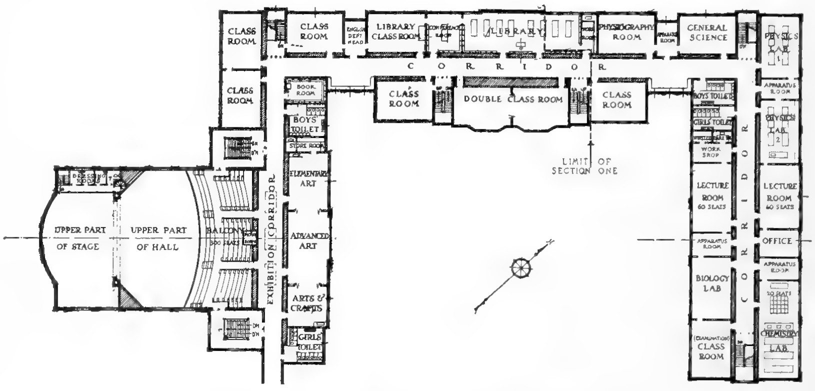
Under these conditions architects may take new courage and resolve to profit by the reduction in building costs by devoting new energy to the better solution of schoolhouse problems. If it may be so put,—"Now is the time to raise the standards without increasing the cost." With this in mind, let us review the schoolhouse situation historically and critically and try to find a secure foundation for future professional work.

Our grandmothers went to a one-room district school, and sat on benches. When they were study-

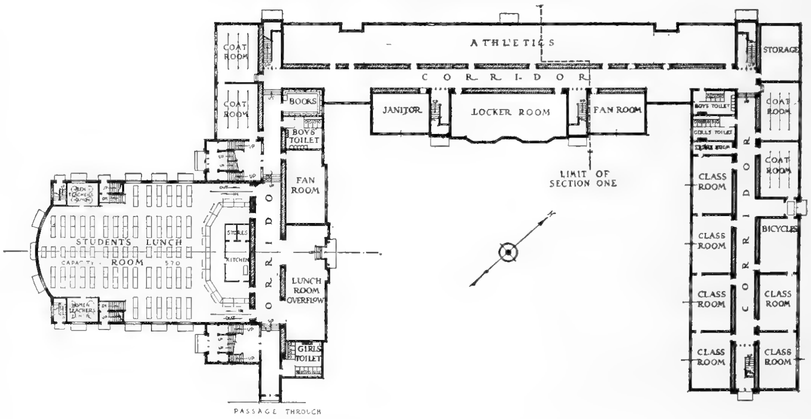


Perspective Drawing, Auditorium Wing of Brookline High School, Brookline, Mass.
Kilham, Hopkins & Greeley, Architects

ing their backs were toward the teacher. When they recited, they threw their feet over the benches and faced the music. The buildings were heated by stoves, and ventilated by cracks in the floors. Very little in the way of "equipment" was furnished or required. The capital invested in the school building was about $5 per pupil, and the results were measured in 100 per cent Americans, six feet or more in their homespun stocking feet.

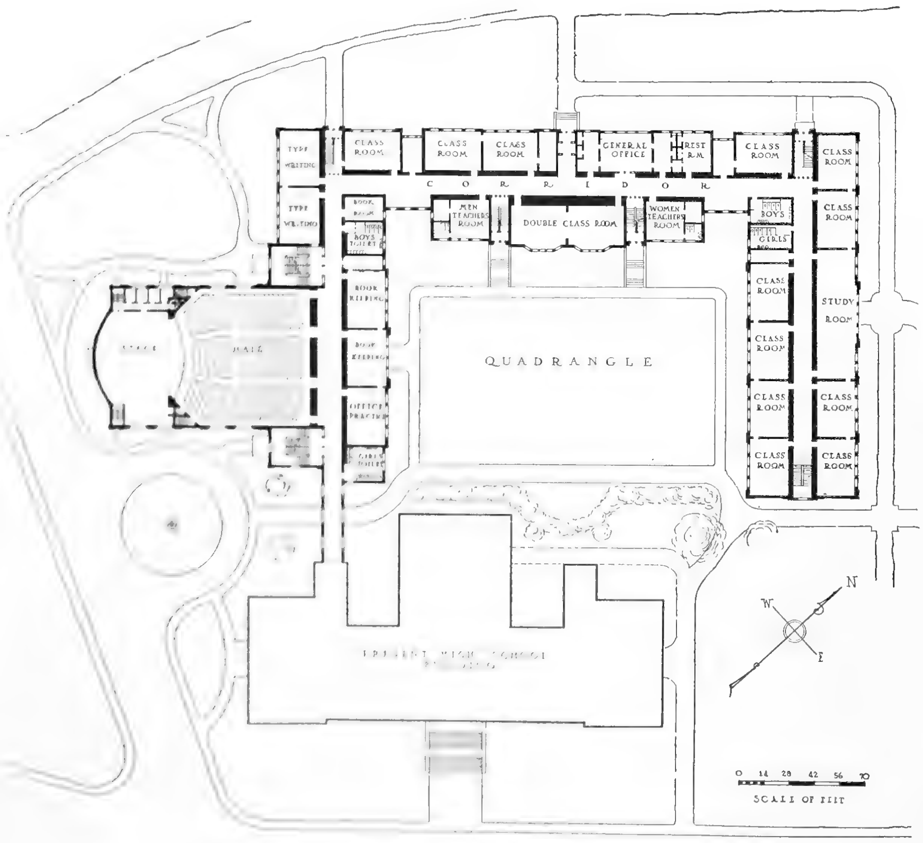


Second Floor Plan, Brookline High School



Basement Floor Plan, Brookline High School

Today we put $250 to $500 per pupil into an elaborate building, and it is a question if the modern men and women that we turn out there excel the earlier type; at least it is doubtful if the 100-fold investment produces 100 times as good a result. The old wooden buildings were increased in size in the latter part of the last century, and large new buildings were constructed, often entirely of wood. Here and there one was burned with loss of life. There followed a crusade of building laws which brought about the construction of buildings that were safe as far as loss of life from fire was concerned. The building laws, however, went further and specified minutely how much air should be provided per pupil, just what toilet facilities were to be furnished per girl and per boy, and many other details of that kind.



First Floor Plan, Brookline High School, Brookline, Mass.
Kilham, Hopkins & Greeley, Architects

"Standardization" then followed and we are still under the spell of this panacea. To what does it lead? Probably the object is to produce a standardized American by the use of new, standardized desks, in a standardized room with standard air at a standard temperature, under standardized teachers whose old age will be pensioned by Standard Oil. The first weakness is that the effect of standardization is stagnation. Until a perfect form has been evolved, to standardize is to stifle further development. This is the case with schoolhouse design.

The second point of danger lies in the fact that most standards are minimum standards. The tendency of a standard is to seek the lowest level. If, for example, rigid economy during the last few years has forced the adoption throughout the country of 10-foot corridors as the minimum permissible width, 10-foot corridors become the "standard," and are accepted by committees and architects of limited experience as "standard" in the sense of being "ideal," which is really a mistake. Just as long as educational methods themselves are changing, just so long should schoolhouse design continue to change to meet the requirements. Any data, therefore, describing existing schoolhouses, should be labeled "Current Practice Relating to Schoolhouse Design," or "Prevailing Tendencies Governing the Schoolhouse Plan." To describe such data as "standards" is to ossify a growing organism, and to use the term "standardization" suggests some compelling force from above.

All these factors in the schoolhouse problem spell for the architect, and the committee too, hard study and firm courage rather than juggling with standardization. The community that is going to have the best schoolhouses is the one that insists on going over with its architect carefully the educational needs of the pupil, so that in addition to his experience in meeting similar problems elsewhere, he may have the fullest co-operation of all hands in solving the particular local problem. No architect is competent to work out the plan without drawing constantly upon the ideas of the committee and superintendent, with an intimate understanding of the methods of instruction in all its varied branches.

Approached in this way, one problem will be solved in one fashion, another differently, and all communities will profit in the end by the diversity of solutions. Through standardization, all design becomes flat and stale, and finally unprofitable, as standardization is the acceptance of existing mediocrity as a criterion of excellence. Through individual study and experience comes a diversity that lends zest to the solution of the problem and hastens the millennium. The art must be kept plastic, and not be allowed to solidify. So completely is this the case that the well-meant restrictive laws or "standards" of the last two decades are now a serious impediment to progress. The futility of endless legislation is nowhere more glaringly evident than in the field of schoolhouse design. It would seem unwise to add to this mass of legislative restriction a new load in the form of "standardized requirements."

During this period of development in educational methods, planning must develop too, and this can be accomplished not by the "adoption" of "standards," but by the constant "application" of "common sense" to schoolhouse design.

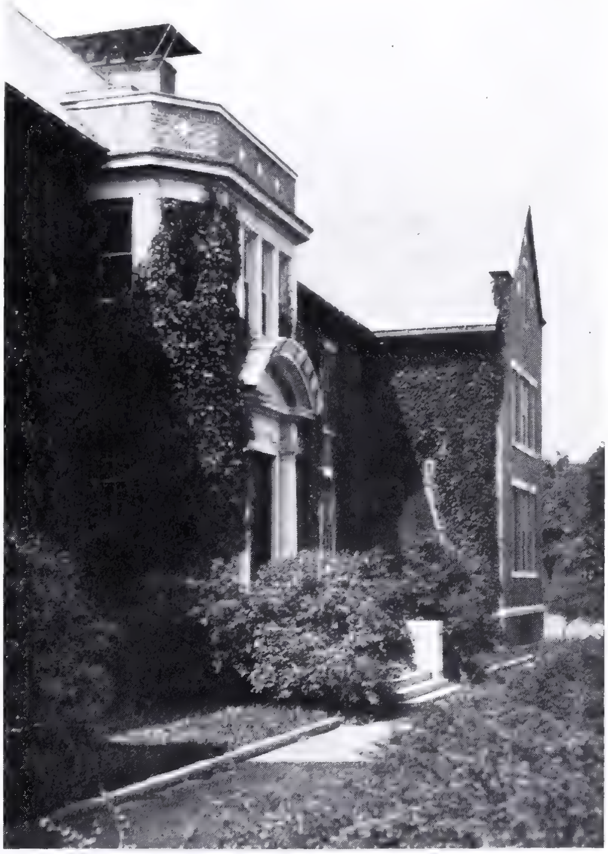
The application of common sense to present-day schoolhouse needs discloses many simple truths. Here are some of them:

1. The average community is growing. It is not enough to plan smugly a single building. Consideration of future school districts, and enlarged capacities of present buildings, must form part of the program. A study of the school situation throughout the town is usually required before approaching the individual schoolhouse problem.

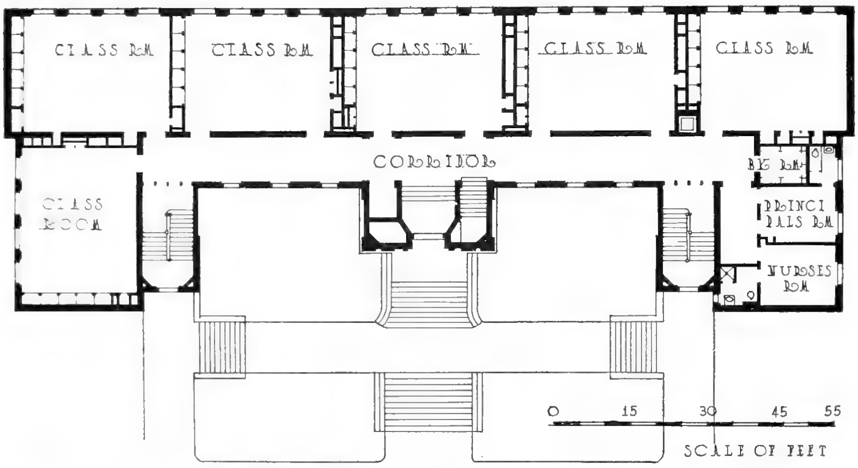
2. Teaching methods are changing, and knowledge of how to teach has outstripped financial ability to pay. Therefore buildings should make easy the gradual future subdivision of classes to meet requirements already set down as necessary. Classroom spaces should be subdivisible at will into different sized units.

3. Subjects of instruction are changing. Rooms should therefore be readily convertible from one use to another.

4. The point of view on life as a whole is changing. It will soon be considered as defeating one of the great advantages of education if children must be sent to spend their days in a purely mechanical building without any redeeming graces of color or



Michael Driscoll School, Brookline, Mass.
A design to accord with residential character of community
Kilham & Hopkins, Architects



Floor Plan of School for City of Boston, Recently Contracted for Less Than 35c. per Cubic Feet
Kilham, Hopkins & Greeley, Architects

proportion. The illustration of the Michael Driscoll School shows an attempt in a residential neighborhood to avoid the "packing box" type of school building by the employment of such features as a pitched roof and a bay window in the corridor, neither of which is a "standard" form. The extravagances of the bygone florid period of schoolhouse design are not to be commended, but the idea is constantly and rightly gaining ground that *cultivation* as well as mere *education* is our next objective and, as far as the appropriation will allow, a schoolhouse should have an open, airy, cheerful and homelike effect, even if a certain factory-like "efficiency" is impaired.

It should be both: (1) Agreeable in appearance, though not necessarily monumental, and

(2) Of such a type of construction and finish as to avoid a large expense for upkeep and repairs. And herein lies one of the most important points of the "fourth dimension." How many committee men, when they are about to select an architect, are carried away by colored pictures and plausible talk about "standardization," thermal units, single-floor plans, and so on, which the facile salesman uses to divert attention from the fact that in his past work his roofs leak, his floors sag, and his pipes freeze? And how many are willing to take the trouble to find out personally whose buildings are intact after five or ten years, and whose have had so much repairing that little remains of the original structure?

In the development from the old wooden building to the present highly standardized and "efficient" schoolhouse, much of the cheerfulness and comfort of the older building has disappeared. In the modern schoolroom, with close ranks of monotonous desks screwed to the floor, windows confined to one wall, and the other walls made gloomy by great expanses of blackboards, there is little to cheer the teacher or the pupils. Some possible advantage may be argued on the score that such rooms by their ugliness may increase the pupils' love of home, but on the whole they leave something to be desired. The physical needs are seen in a new light. The deadly draught is becoming less of a bugaboo. Unvarying temperatures are now admitted to be enervating. The standard room with its standard amount of steam-dried air, dependent for its circulation upon closed windows, will before long cease to satisfy us. It is no longer considered wise to transfix a child at a desk through hours of instruction. Even the old method allowed him to kick his feet over the bench when he recited. The need of some physical activity to keep the mind alert has begun to be felt. To the requirements just enumerated there is sometimes added the selection and development of a site, and all these possibilities are dependent upon the purchasing power of an appropriation that is usually insufficient in amount.

In some communities, very careful studies have been made to determine questions of location, probable future growth of population, etc., and have resulted in four things:

1. Great saving in time.
2. Considerable economy in cost.
3. Avoidance of bitter and prolonged dispute.
4. A much better educational plant.

After the site is selected, the questions come on the orientation of the various rooms, and the fixing of the location of the building on the lot. The exposure most desired for class rooms is southwest. The accompanying plan for a schoolhouse now under way for the City of Boston shows an arrangement in which all class rooms have sunny exposures, and most of them face southwest.

After proper study of these preliminary matters, the detailed working out of the plans becomes a matter of logical sequence. When the plans have been drawn and the building completed, comes the time that the architect is most likely to fail in his professional service. In moving on to new fields, the completed work of the past is forgotten. This is wrong. An occasional visit to a school building, already completed and in actual use, not only assists the client, but is the only way in which the architect can know how his buildings "wear." The upkeep of a school building requires a large sum, at best. By keeping informed on matters of renewal, painting, etc., the architect can learn to specify the materials that will be most economical in the long run by giving better wear.

In view of all these considerations, it is therefore true, paradox or no paradox, that the most important service of an architect is that part of his advice that comes usually before he is employed, and that part of his inspection that comes after he has been discharged.

Baroque, Justice and Common Sense

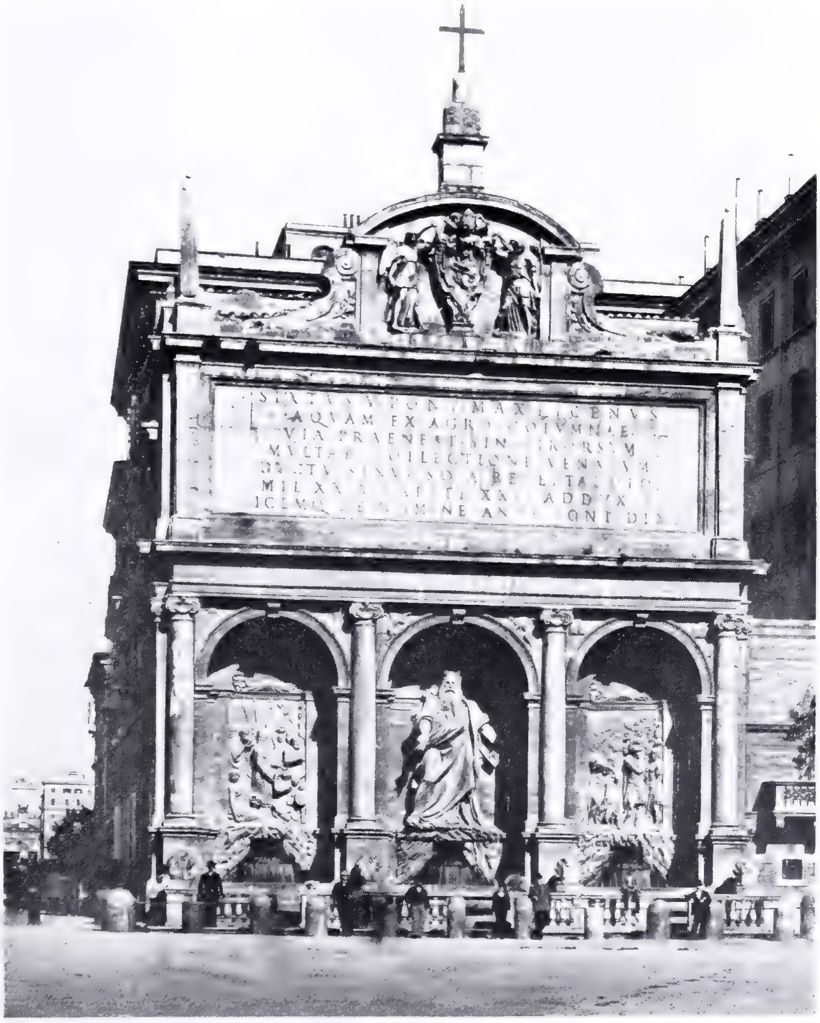
PART II

By COSTEN FITZGIBBON

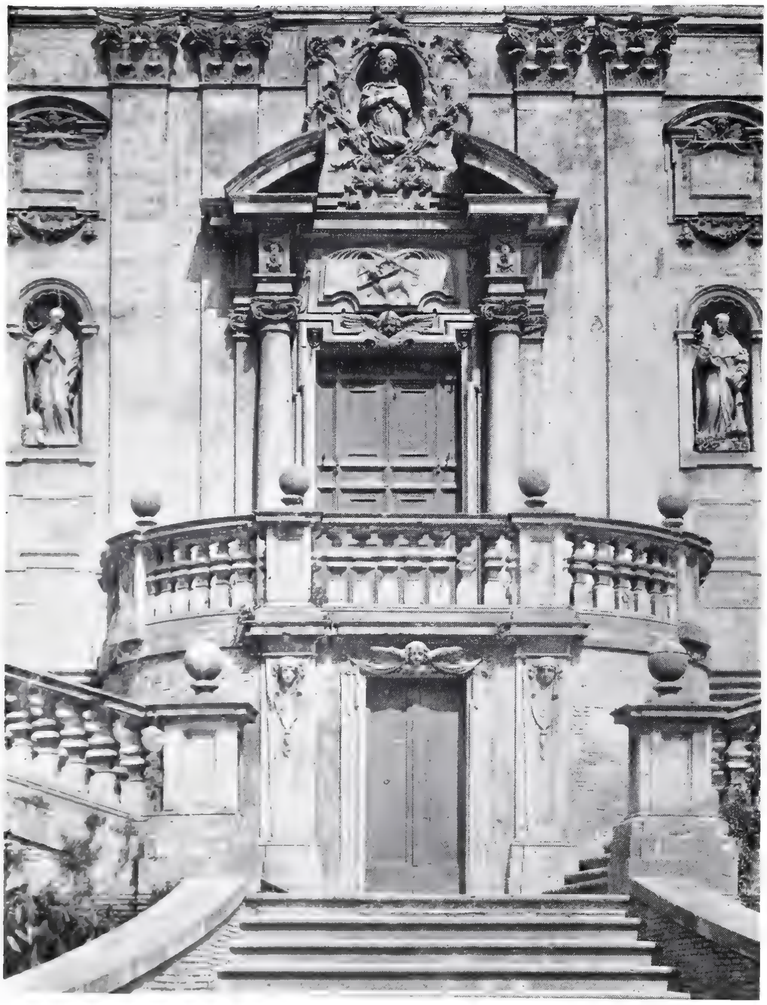
IT would be equally diverting and illuminating to trace the career of each great baroque architect, note his chief performances, and appraise the value which his individual efforts added to the sum total of baroque development. Such a critico-biographical method of pursuing the subject, however, would require a generous sized volume in order to cover thoroughly even a portion of an amazingly prolific period of architectural history, so that notwithstanding the many allurements of intimate insight it would afford, we must here content ourselves with a more condensed body of careful generalizations.

Whether in our researches we follow the detailed plan of investigation just alluded to or whether we survey the field in the more general and impersonal way, we cannot fail to become fully aware of an ever broadening rift between the two main streams of architectural ideals and manners of expression from about the middle of the sixteenth century onward. As the high renaissance merged into the late renaissance one school of architectural thought tended to become more and more academic and to attach increasing emphasis to the value of ancient precedent. Following in the steps of such masters as Bramante, Baldassare Peruzzi, the Sangalli and their compeers, and emulating their ardor for classic research, their successors exercised their genius in an unfaltering quest for purity of form, as they conceived it, and in devising fresh combinations of orthodox classic motifs and methods of composition to fit the specific requirements of their own generation. To this persistent and conscientious endeavor to vitalize the heritage of classic antiquity we owe the noblest works of Palladio, Samichele, Sansovino and the lesser men who followed in their train. No matter what may be one's personal convictions or degree of sympathy towards the attitude of these pre-eminent exponents of classicism, it must be admitted that they displayed no little originality in the manipulation of the resources to which they voluntarily restricted themselves, availing themselves of reasonable interpretative liberty.

The other school of interpretation, while not at all condemning the treasures of the past nor assuming the pose of revolt that deliberately casts tradition and precedent overboard, nevertheless chose to use precedent in its own free and eclectic manner and to employ the "properties" derived from antiquity according to the untrammeled promptings of its own robust and exuberant invention. As previously noted, this movement—the baroque style—which made itself appreciably felt in the latter part of the sixteenth century under the guidance of such men as Giacomo della Porta, Domenico Fontana or Buontalenti, ran a parallel course with the late renaissance school for a time, though ever growing more distinct from it, and



Fontana dell' Acqua Felice, Rome, about 1590
Designed by Domenico Fontana



Detail of Facade, Church of San Domenico e Sisto, Rome
Designed by Vincenzo della Greca

gradually increasing in force eventually won complete ascendancy in the seventeenth century, an era not inappropriately termed the baroque age. The baroque influence continued to be a lively force through part of the eighteenth century, but after its meridian was passed we need not expect to find in it the same vigor and spontaneity it exhibited at an earlier date. It is to the seventeenth century that we must turn for the best and most characteristic examples. During the period of incipient baroque, when the two streams of thought were getting farther and farther apart, the classicists as heirs and guardians of renaissance tradition stood for the integrity of conservative principles; the baroquists were the liberals. It is our present concern to analyze carefully the dominant tendencies of this second or baroque stream of architectural activity, to mark its commonly distinguishing characteristics, to observe the methods and aims of its representative exponents, to point out its concrete achievements in the path of architectural progress, and to indicate certain particulars in respect to which we are today its debtors.

Two external influences gave the baroque trend so much impetus that it is imperative to take cognizance of them. In the first place, the period embraced by the latter part of the sixteenth century and the greater part of the seventeenth witnessed the accumulation of vast wealth and great estates in the hands of the Roman nobles, the holy see, the cardinals and other dignitaries of the church and those who in one way or another were attached to the papal court. It was a conspicuously ample and expansive age, a time of broad conceptions and also of ostentatious and lavish expenditure. Under the grandiose sway of paramount Spanish influence, ecclesiastical and secular dignitaries alike vied one with another in their liberal patronage of architecture and the allied arts. Fortunes were on a scale unprecedented since the days of imperial Rome and the extent of the undertakings conceived by the possessors of these fortunes corresponded with the sizes of the fortunes themselves. It was but natural that architecture should be made to accord with the magnitude of the conceptions it was employed to embody in visible form. In the baroque manner the princely patrons of architecture found an apt instrument for the expression of their ideas of imposing magnificence. Never did any form of architecture more faithfully or more completely reflect the spirit of that age in which it was developed; never did any age more whole heartedly support and foster the growth of an acceptable manifestation of contemporary architecture. Architecture ministered to and encouraged the ambitious plans of its patrons; the schemes devised themselves fed architecture and spurred the imagination of the architects to new flights. Each element of the dual combination nourished the other and we behold a phenomenal display of complementary interaction. Both elements were causes, and both were likewise effects.

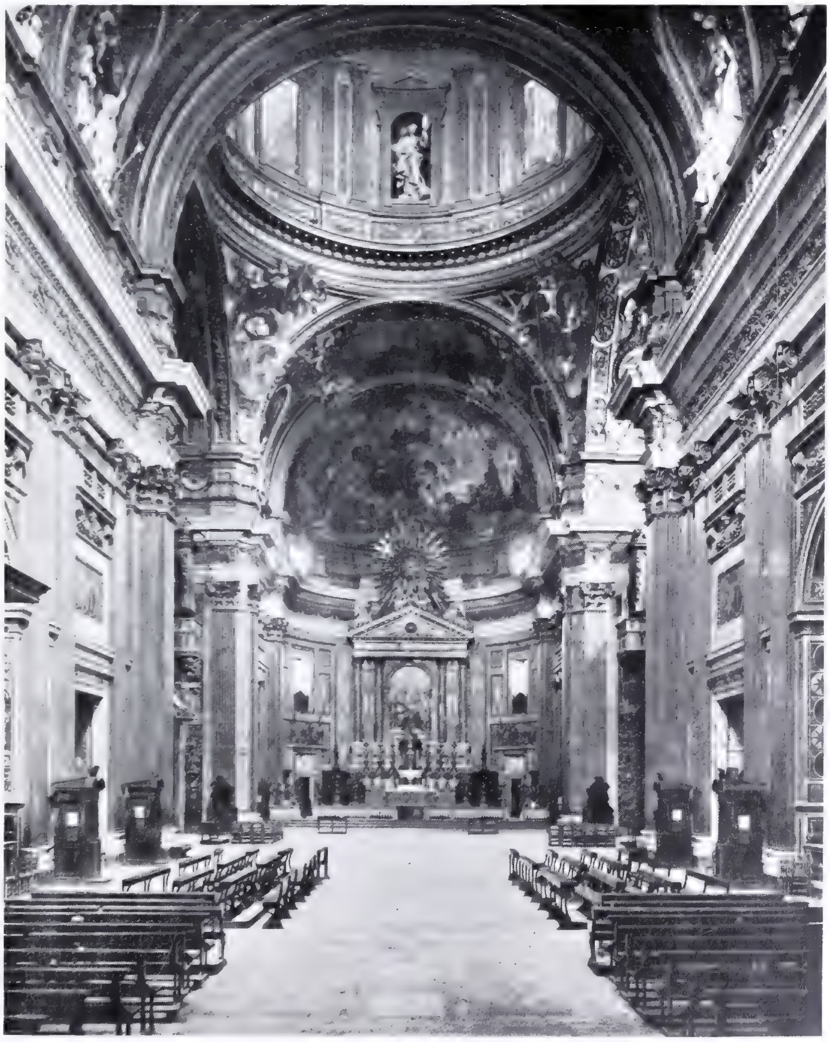
The second external factor that contributed impetus to the baroque movement was the counter reformation. The members of the Society of Jesus charged themselves, as one of their special obligations, with the revival of religious zeal and the stamping out of heterodoxy. Their well directed and unremitting labors produced amazing results in reawakening religious consciousness and fervor among the masses. They plainly saw, however, that it was not enough merely to overcome religious indifference and rekindle the smouldering fires of faith; it was necessary by some outward and visible symbol to give the people a permanent reminder of the authority, might, majesty and splendor of the church. The baroque form of architecture was well adapted to this end. The company of St. Ignatius Loyola seized upon it as an opportune instrument, invested with an appropriate appeal to the senses, and forthwith reared the great churches that characterize the era, or refronted old churches with baroque facades. This they did not only in Rome, but throughout Italy, throughout Spain, and in the countries beyond the Alps. Even in Latin America this type of ecclesiastical architecture left its indelible impress. So numerous were these edifices, newly built or refronted, so rapid was their multiplication, and so intimately identified were they with the activities of the Jesuits that baroque architecture has often been styled "Jesuit architecture." The type of church chosen by the Jesuits at the counter reformation continued in favor long afterwards and bore witness to their presence in widely scattered localities.

So much for the two outside forces that served in so great a measure to popularize the baroque mode. So much, likewise, for the spirit informing the style. It now remains to examine somewhat the substance with which that spirit was clothed, that substance which has so frequently been the target for bitter animadversion on the part of unfriendly critics.

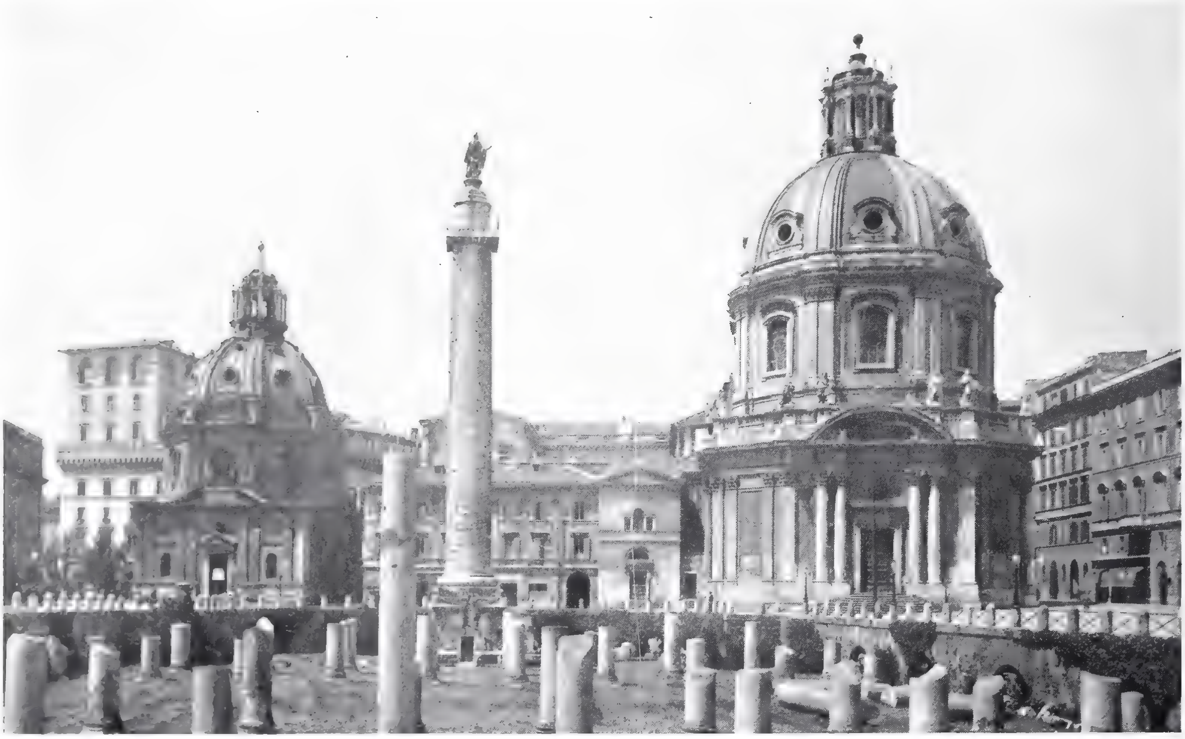
If the seventeenth century—the baroque age— was a period of splendid amplitude, it was also a period of license and daring initiative in nearly every phase of life and, consequently, in those forms of art wherein the life of the time found its readiest expression. This being the case, it was inevitable that excesses and indiscretions should occur in current architectural exploits, incidents that baffle any logical attempt at justification. But such incidents, it should be remembered, are only incidents and of a superficial nature that should not affect our mature judgment upon the real character of the great body of architectural production of that period.

Objections to the baroque style, based upon these occasional excesses and absurdities, we need not undertake to answer. It would be idle to do so. Other objections, less captious perhaps, and made with more honest intent, must likewise be left for the individual reader to ponder over as he examines the first hand evidence which the buildings themselves supply. It does not constitute a valid and final condemnation of baroque architecture in general to assert that it was vulgar, bombastic, ostentatious and self-conscious; that it was boisterous, bizarre and disorderly; that it was coarse in its details and affected in its manner of ornament; that it was sensuous and voluptuous and even grossly sensual; that it was immoral in spirit and devised by libertines for libertines; that it was, in short, the work of a degenerate age without manners, morals, or even rudimentary good taste. These, and like cavils, voiced by some whose inaccuracy brings them perilously near the bounds of arid dullness, may be merely noted and allowed to go at that. How much weight is to be attached to them, the reader who conscientiously surveys the field can judge for himself. Let us turn quickly from this negative sort of carping—it is not worthy the name of criticism—and address ourselves to considerations of a more positive and constructive character.

Among the more outstanding positive phenomena to be discerned in a general scrutiny of baroque architecture, five major points challenge our attention. They are so insistent that we cannot escape from them. We find (1) the almost universal



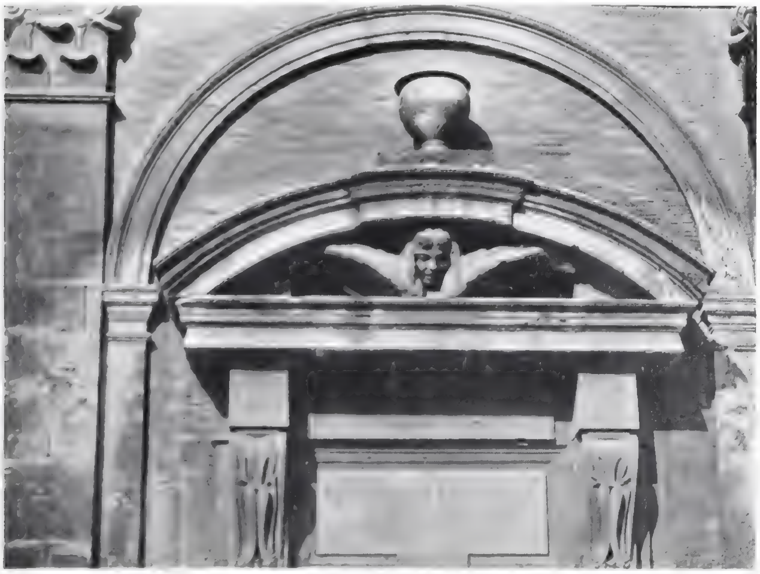
Interior, Church of the Gesu, Rome
One of the best examples of the baroque, and attributed to Vignola



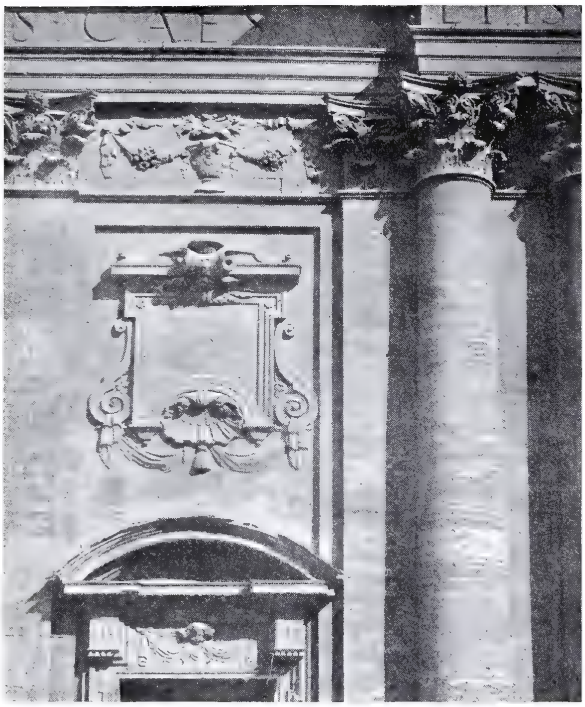
At Left, Santa Maria di Loreto, Rome, Begun in 1507 by Sangallo the Younger; Portal and Lantern by Giovanni del Duca, 1580. At Right, Santissimo Noma di Maria, Built 1738

prevalence of noble and monumental scale; (2) complete symmetrical conception of comprehensive and connected schemes of composition, in contrast to the more or less fortuitous and piecemeal methods that often obtained at an earlier epoch; (3) the high value attached to the dramatic element and its development to a degree previously undreamed of—at least since the days of the Cæsars; (4) the ingenious elaboration of divers and remarkably effective plan forms, and (5) the undeniable advances made in connection with garden design, with vastly enlarged scope of treatment. It is scarcely too much to say that in the work of the baroque age is to be found the beginning of modern architectural conception, at any rate so far as our larger and more monumental undertakings are concerned.

It would of course be unreasonable and rash to claim that the baroque architects were the first to inaugurate the use of heroic scale—there are too many notable instances of far earlier date—but they unquestionably developed and generalized its use, employing its resources to dignify even their domestic work. In this connection, Martin Shaw Briggs pertinently observes that "the most important aspect of baroque architecture in Italy . . . consists in a power of monumental planning and arrangement which is rather a gift than an exact science. Up to late renaissance times men still lived in crowded alleys within the mediæval city walls. With the dawn of the seventeenth century appears a desire for more space, and notably for sufficient space to enable a building to be properly seen. All the finest *piazze* in Rome date from this period, and in Genoa was laid out the first street where æsthetic considerations were apparent." What was true of the ability of seventeenth century Italian archi-



Detail of Doorway, Santa Maria di Loreto, Rome

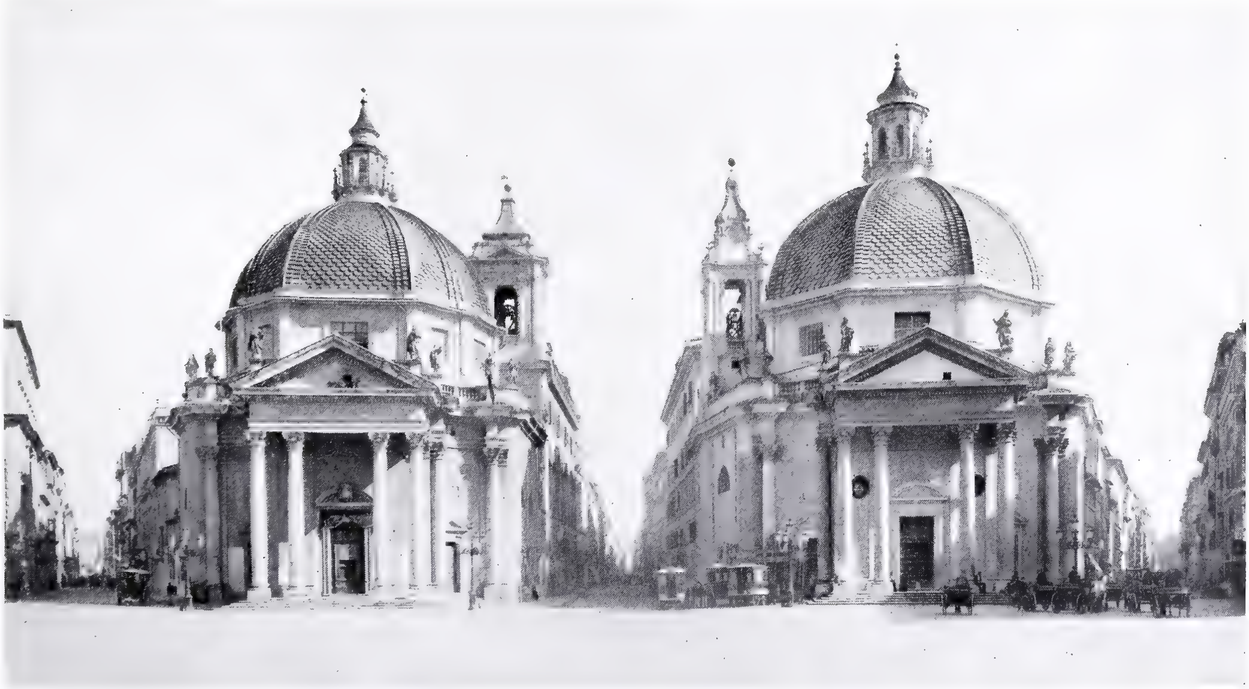


Detail of Facade, Santa Maria in Vallicella, Rome
Designed by Martino Lunghi the Elder

tects to plan monumentally was likewise true of their close students and admirers, the French architects of the same period, who were profoundly influenced by what was going on in Italy and drew thence the chief essentials of their inspiration. The situations of many of the important buildings evince not only the love and appreciation of a fine position but also a rare genius for making the most of it. Incidentally, in the disposition of such civic adornments as the Spanish Steps in Rome or the Fontana dell' Acqua Felice, we not only have ample evidence of a keen understanding of the value and proper use of heroic scale along with imposing site, but we can also trace the incipiency of coherent town planning.

Closely allied with the thorough understanding and habitual use of heroic scale was the devising of symmetrical and comprehensive compositions, often of very considerable extent, whether in city or country. Individual units, instead of having their individuality emphasized, were subordinated to an all-embracing scheme of design, thus securing an appreciable gain in breadth and spaciousness of aspect. Without entering into the causes back of this particular development of baroque architecture, it will be sufficient to call attention to the impressive and harmonious *ensembles* thus produced, to note that the cue thus given in Italy was promptly taken up and followed in France, with what distinguished outcome under the liberal patronage of Louis XIV we very well know, and to point out the singular inconsistency of those who willingly admit their deep indebtedness to Le Notre, Le Brun or Mansart while, in the very same breath, they revile the "accursed" Bernini and Borromini with all their unholy baroque crew.

The stress laid by its authors upon the third distinguishing characteristic of baroque architecture —its dramatic quality—brings us at once to a bone of contention. In a large number of cases the dramatic quality attained was the result of deliberately striving for effect, a procedure which critics,



At Left, Santa Maria di Monte Santo, Rome, 1662, Designed by Carlo Rainaldi. At the Right, Santa Maria dei Miracoli, by Rainaldi; Altered by Carlo Fontana, 1663 and especially unfriendly critics, are wont to brand as illegitimate. Nevertheless, the baroque architects did strive for effect. What is more, they achieved it, and they achieved it in a notable degree, as their works bear eloquent witness. On this same score of striving for effect are based the charges that instead of ornamenting structure, they created structure to carry ornament; that they were untruthful and did not externally express the plan or purpose of a building; that they confused and misapplied ornament, exaggerated the scale of details, and practiced deception in materials; that, in fine, they committed all the seven deadly sins and several more besides.

Now the exaggerations of mouldings and other details, of which the critics complain, were in some measure due to the nature of the coarse grained travertine which was unsuitable for the execution of smaller scaled items. The close grained *pietra serena* of Florence lent itself to more delicate manipulation, but Tuscan baroque architecture lacks the force of Roman. The delight of big, vigorous forms could readily be realized in travertine, and the material itself doubtless encouraged the use of such forms and strong details, over and above the important consideration that they rendered the composition of a building, when seen from a distance, more articulate and impressive in definition. As to the confused and misapplied ornament in the shape of superfluous pillars, entablatures and pediments, it must be admitted that baroque interpretations in this respect did not accord with scholastic usage. At the same time, we should remember that these erstwhile structural features had long since lost their strict structural significance and had really become to a great degree decorative conventions. To the seventeenth century architect, therefore, it seemed quite permissible to introduce a fresh, and what appeared to him a more satisfactory, way of marshaling these conventionalized forms. The "deceptions" in material and the "untruthfulness" of expression were not deceptions. A deception is not a deception unless there be present the intent to deceive. The so-called deceptions were meant merely to please the eye. There was in them no intent to deceive, nor did they deceive anyone.

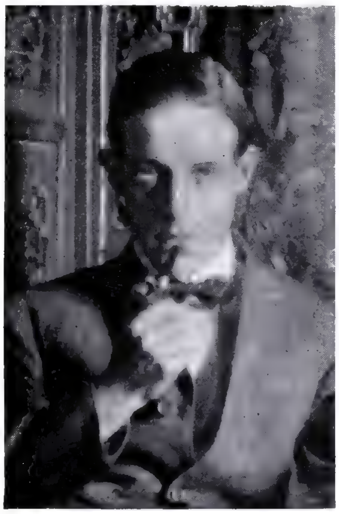
The foregoing discussion does not pretend to be a vindication of baroque architecture. Its purpose will be achieved if the reader is moved to pursue for himself *in extenso* an investigation of the work of the baroque age; to apply the methods of justice and common sense in formulating his judgments; to admit our present indebtedness to baroque precedents where such admissions are due, and to refrain from a prejudiced blanket condemnation of a great epoch on the strength of the indefensible excesses perpetrated by its most extreme exponents. The baroque movement was not an insincere manifestation got up merely to satisfy a factitious enthusiasm for inordinate display. An intelligent acquaintance with baroque architecture, even though we may not elect to follow its practices to any great extent, is needed as an antidote to the constriction of ideals apparent in certain quarters today.

Stairway and Fountain, Villa Lante

Domestic Architecture of Henry Corwith Dangler, Architect

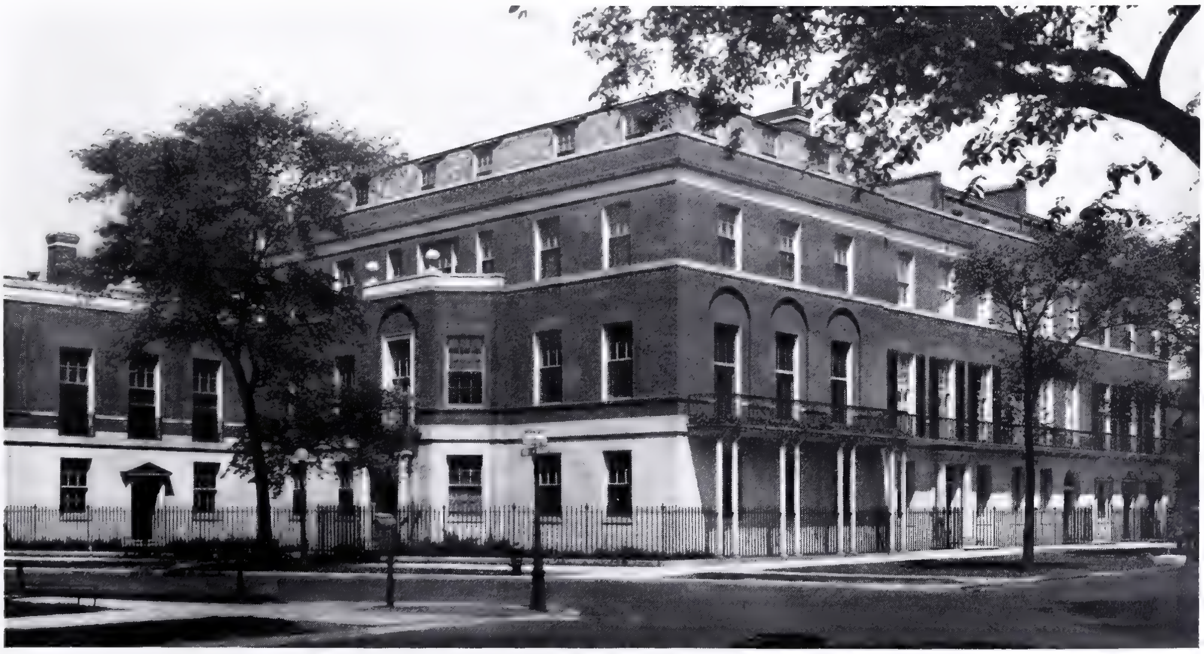
HOUSES DESIGNED BY DAVID ADLER AND HENRY DANGLER

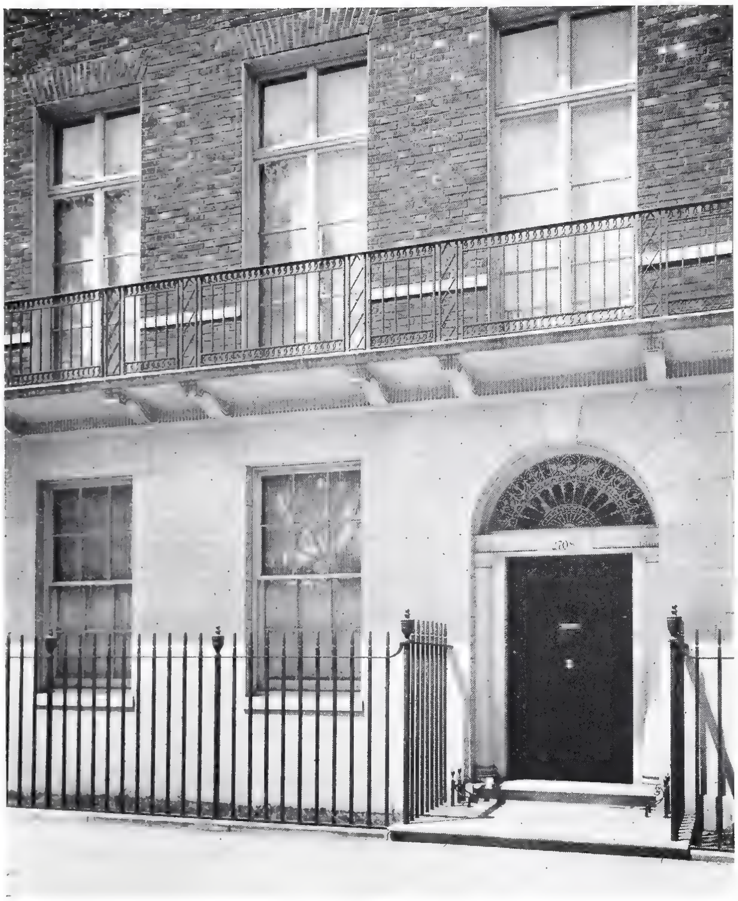
THE last decade in the growth of American domestic architecture has witnessed a distinct change in the manner with which architects approach their problems, and this together with a public more appreciative of good architecture is the main reason for the great advance in quality this period records. Architects of today are perhaps not producing buildings that may be labeled distinctly American, in fact this was one of the qualities that might be applied to the work at the end of the last century, but it surely had little else to commend it. The work of recent years has been based on a more scholarly study of precedent, confined largely to the English work of the eighteenth century and the simplified version of it found in our own early American buildings. American living conditions, social customs and climatic requirements are more or less unconsciously affecting the American interpretation of earlier precedent, and we are slowly developing different types of architectural expression in domestic work that will eventually be recognized for their distinctive American characteristics. Styles cannot be created by simply wishing for them, and our domestic art will eventually be on a far higher plane because of the restraining influence of precedent which is increasingly in evidence in today's design.


The Late Henry Corwith Dangler

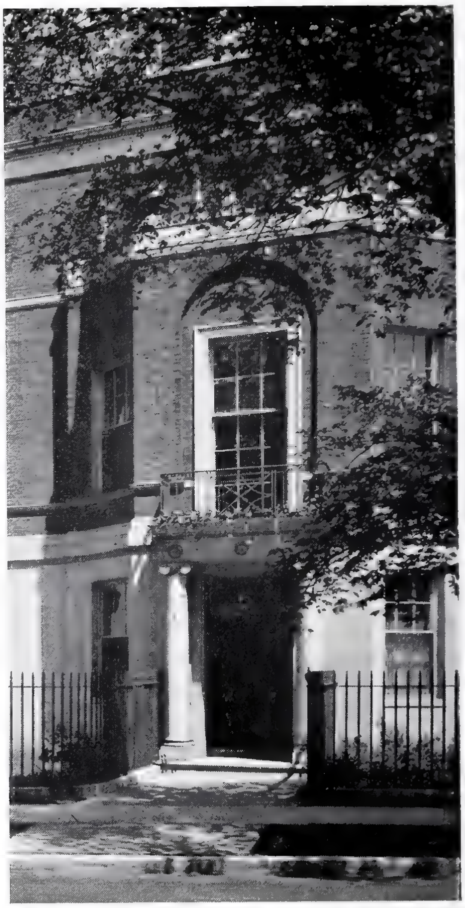
Many architects adopt a definite style and, particularly in domestic work, confine their work to that style. This tends, of course, to producing perfection in the handling of detail and scale, but it has also the possibility of limiting the exercise of imagination with the result that the architecture produced becomes over-refined, academic and lacking in those qualities of charm that come from less restricted efforts. Working in a number of styles with a well grounded familiarity of the basic principles of each develops an eclectic taste which is of the greatest value in producing architecture that has the spirit and charm of the definite period, yet is free from pedantic copying.

The houses illustrated here present an excellent example of this modern American tendency in house design. These buildings are unmistakably American, yet they present a wide variety of styles and each possesses that individual charm of ensemble and detail that makes us admire the originals of the period. They are all derived from renaissance sources, and thus are based on a common classic tradition, yet in such widely separated versions of the classic as late English Georgian, Louis XV and Italian renaissance.


Group of Houses in Chicago of Mrs. Arthur Ryerson and Messrs. Abram Poole, Henry Dangler and Ambrose Cramer

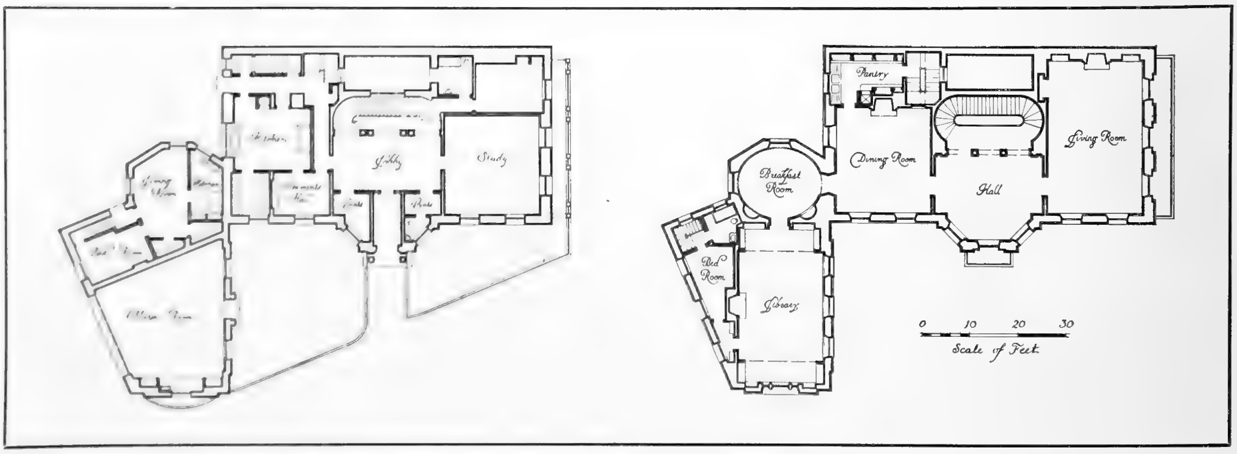


Detail of Main Facade, House of Henry Corwith Dangler, Esq.

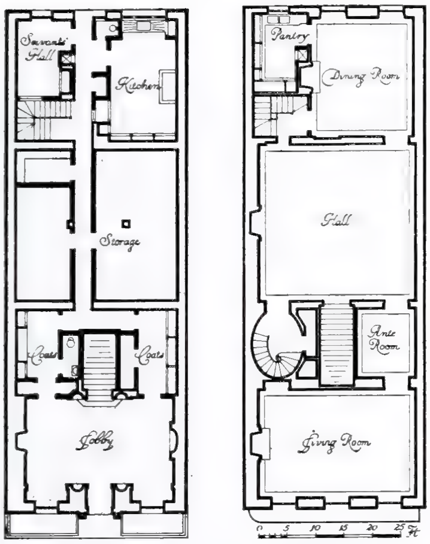


Detail of the Ryerson House

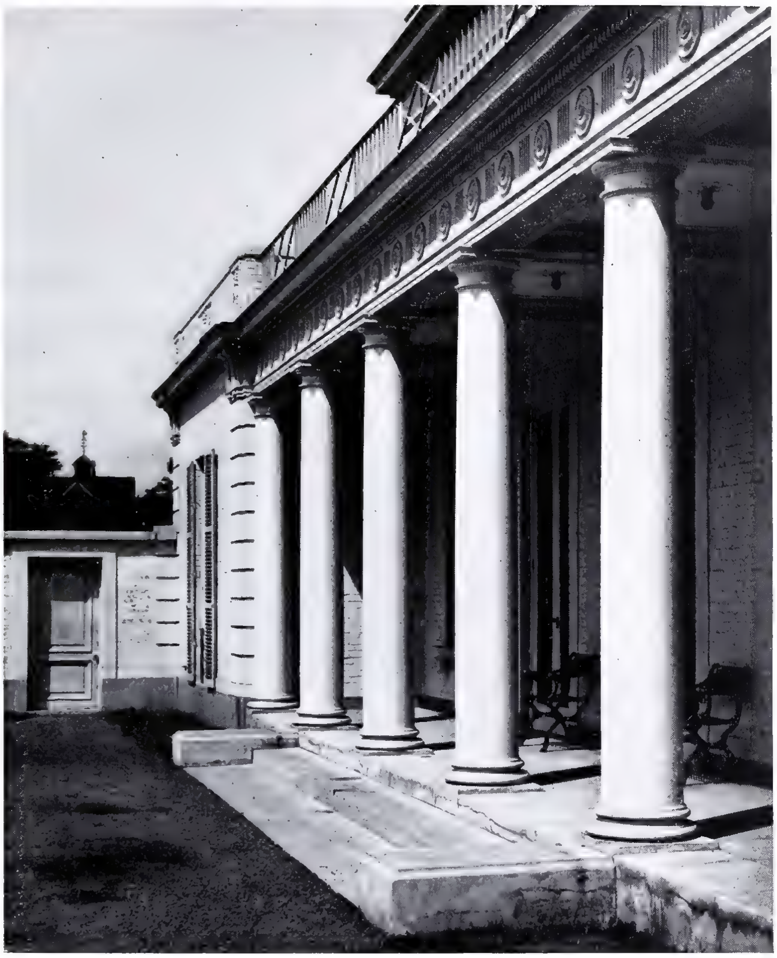
These houses are the product of the office of Henry Corwith Dangler, architect, Chicago, and were designed by David Adler and Henry Dangler. Both designers received the training of the Ecole des Beaux Arts and have been associated since the beginning of their architectural work until the death of Mr. Dangler in 1917. He is remembered for a delightful personality, a keen sense of the beautiful and a great capacity for work. Besides his ability as an architect he possessed a distinct literary gift, satirical and whimsical. The joint work of these designers shows an architectural conception based on a delightful sense of order and proportion; nothing has been left to chance,—character of ornament, composition, scale of mass and detail have all had minute consideration. This thorough study of detail has been made against a background provided by an understanding of the spirit of the styles, and the buildings have a spontaneity of treatment that can be achieved only when the basic principles of a style are known and accepted. It is only the thoroughly grounded student



First and Second Floor Plans, House of Mrs. Arthur Ryerson, Chicago



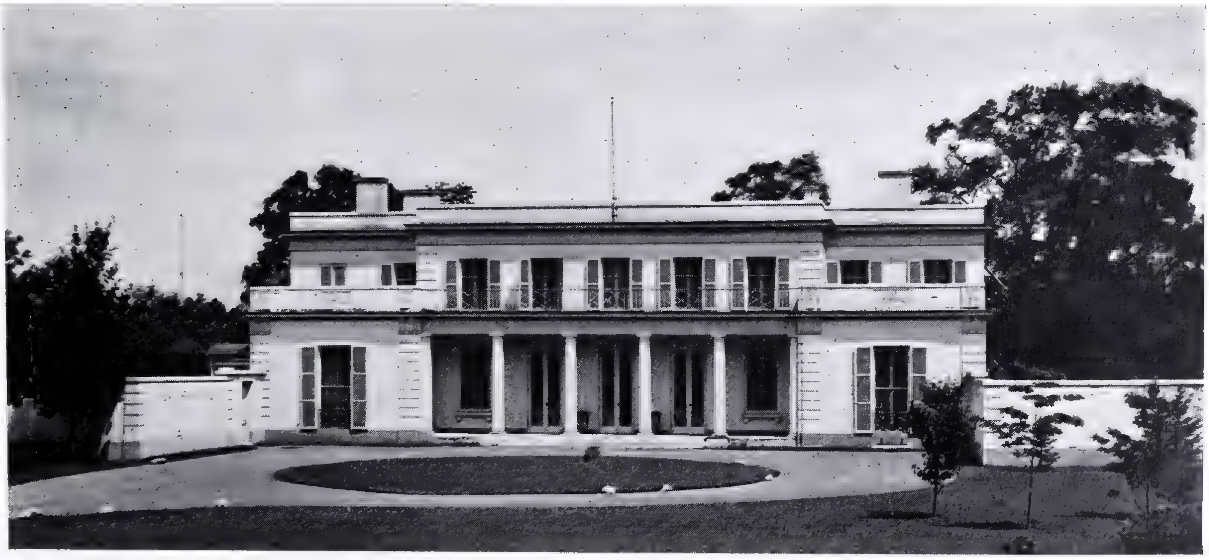
First and Second Floor Plans
House of Abram Poole, Esq., Chicago



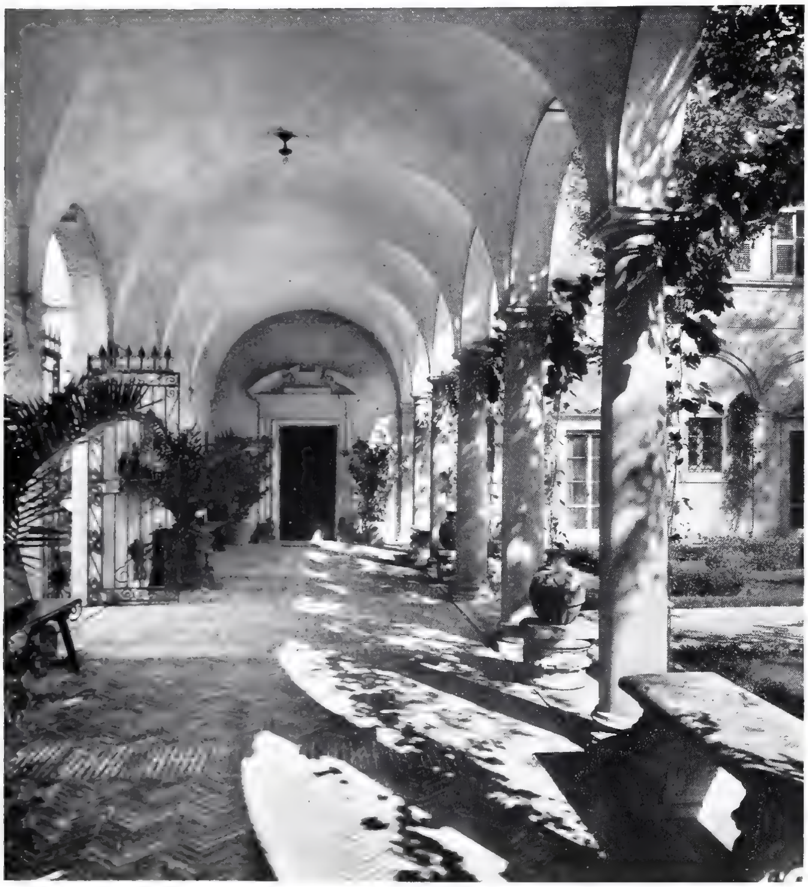
Detail of Forecourt Entrance, House of Benjamin Nields, Esq.

of a style that can safely depart from the letter and preserve the spirit of a past building tradition. Thus is the style made to live again and adequately meet new conditions. This is perhaps most markedly illustrated in the delightful house of Louis XV inspiration for Ralph Poole at Lake Bluff. This has the charm and spontaneity of the wonderful French houses of the period, yet it meets American conditions perfectly, it is admirably suited to its site and in every essential respect is an American house, an excellent example of period adaptation.

Equally characteristic is the handling of the group of four city houses in Chicago. Here special opportunity for the consistent treatment of the major part of a block facade was enjoyed through the co-operation of a group of friends in building adjoining houses. This fact made an architectural treatment in the manner of the late eighteenth century houses of London particularly appropriate, because the restraint and quiet formality of the style have



View of Main Facade on Forecourt, House of Benjamin Nields, Esq., Rye, N. Y.



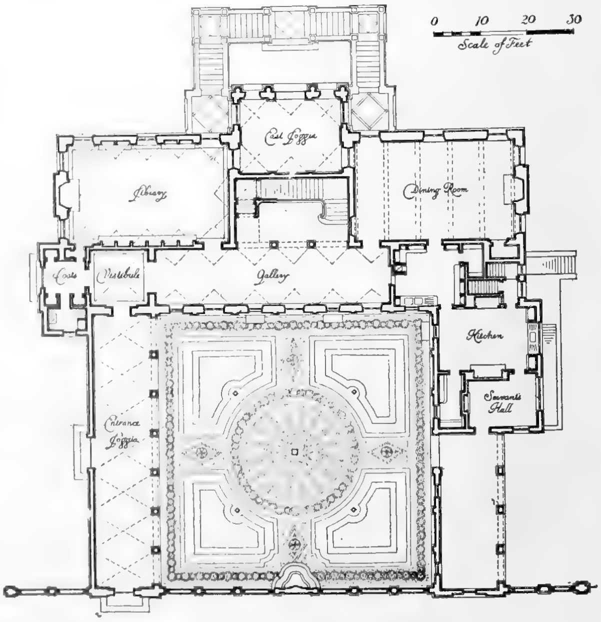
Entrance Loggia, House of Charles Burral Pike, Esq., Lake Forest, Ill.

an opportunity in the larger mass to be appreciated to a greater extent than when compelled to compete for attention with adjoining buildings of more insistent and larger scaled parts.

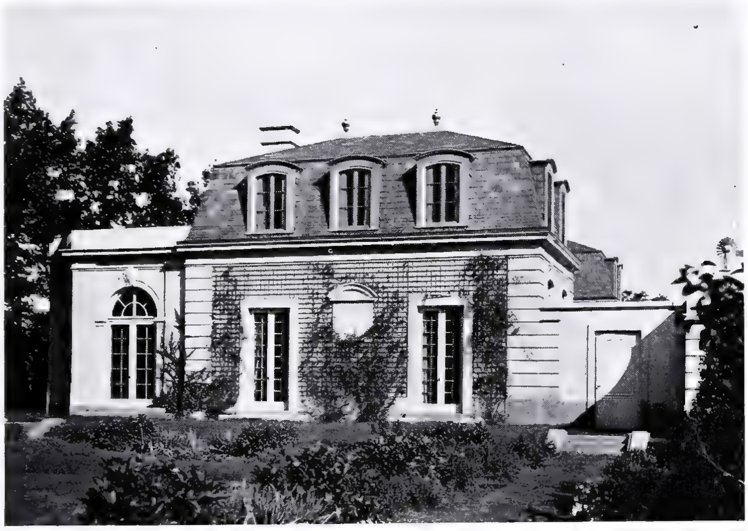
In these houses we see in both exterior and interior treatment the influence of the style developed by Robert Adam and his brother. To them we are indebted for an original and delightfully domestic manner of handling classic detail that is as eminently suited to use today as when it was originally conceived. They have bequeathed to us a series of models of doorways, fanlights, mantels and ceilings that cannot be improved upon for their purposes. But here again the designers of these Chicago houses have impressed their own individuality of treatment in the facades and interiors. The spirit is distinctly Adam but there are directness and simplicity in their handling of composition and detail that produce a spontaneity of conception far removed from careful reproduction.

There are four houses in the group, similar in materials and style but with considerable variation in size. The exterior materials are dark red brick laid in Flemish bond with black headers and light colored mortar joints; the trim is light colored stone; sash and frames are painted cream, shutters green, iron balconies and fences black. The entrance doors are mahogany. An interesting detail of the houses is a community heating plant which is owned and operated jointly; each owner paid the initial cost in proportion to the size of his house, and the expense of operation is charged proportionally according to the amount of radiation in each house.

The plans are arranged to give prominence and a formal treatment to the second floors. There is likewise an agreeable sense of spaciousness even in the houses covering but a single lot. This is especially true in the case of the house of Abram Poole. Entrance is directly into a large hall with an interesting and restrained Adam treatment of decoration. The walls are painted light green, the floor is light toned terrazzo with marble border, and the room is completed with an interesting series of niches and a simple grouping of furniture of particularly graceful design. The wide stairway between walls, directly opposite the entrance, leads to the main hall in the center of the house which is given unusually ample proportions because of the employment of overhead lighting. This room is severely classic and suggests the dignity and architectural character of the early Georgian. The floor is black terrazzo with inlaid brass bands; the walls are paneled and painted in two tones of gray. The doors are mahogany with carved mouldings. The furnishings are selected from early French, Italian and English periods and



Main Floor Plan, House of Charles Burral Pike, Esq.



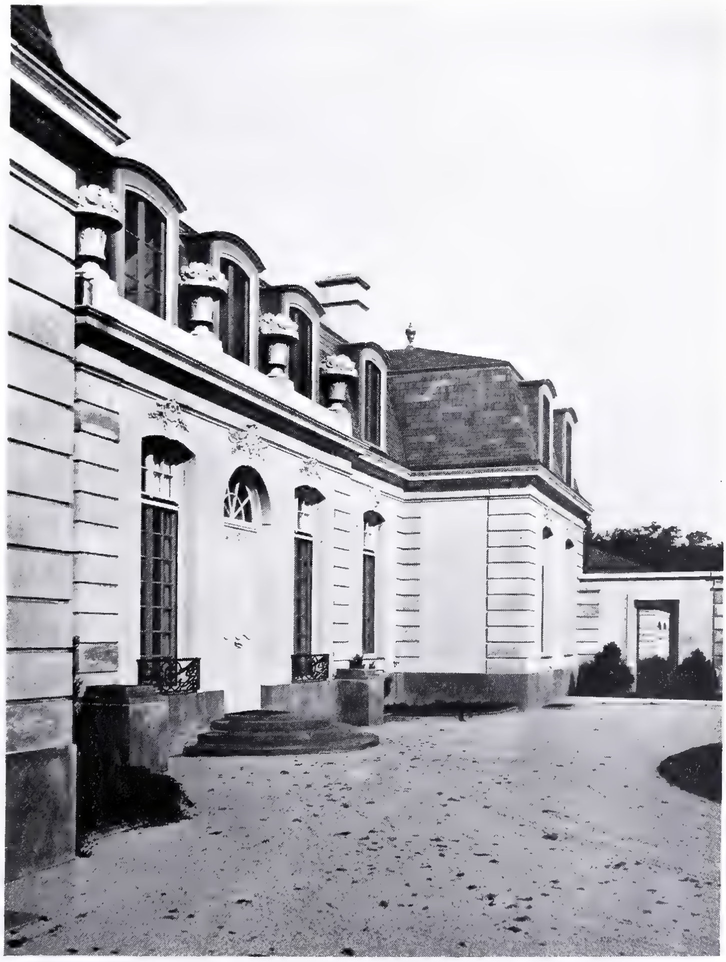
Garden Facade, House of Ralph H. Poole, Esq.

complement the architectural feeling of the room admirably. The dining room is especially bright and interesting in its color treatment. The walls are light green with wainscot and trim painted cream color; a gilded moulding outlines all the features of the room. The mantel is of Adam inspiration in white and Siena marble in contrast.

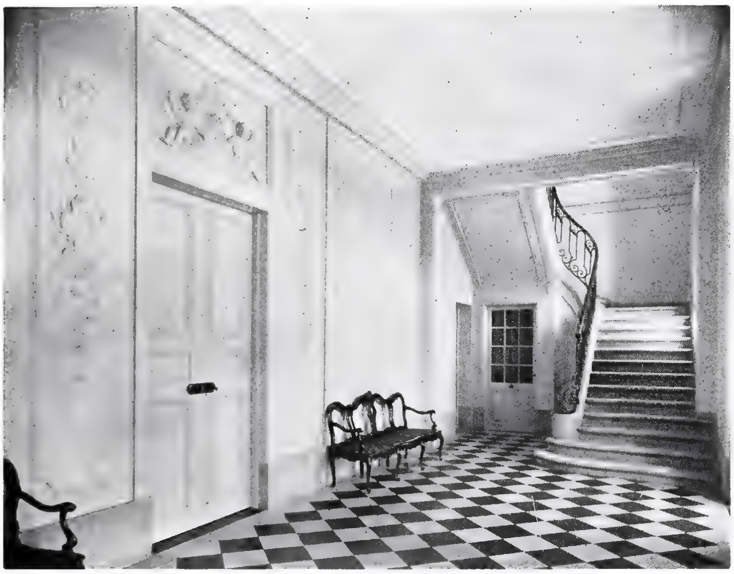
Two interiors are illustrated from Mrs. Arthur Ryerson's house, the largest of the group. The living room is in Georgian character, the detail and ornament reduced in scale to accord with the room size. The walls are paneled and painted a mellow green, and the decorative recesses for books are fitted with metal grilles. The dining room is extremely simple in its decorative treatment. The walls have large recessed panels formed in the plaster and are painted in biscuit color with the ornament of cornice and mantel and panel mouldings in a lighter tone.

The Charles Garfield King house, also in Chicago, is larger than those in the group but it indicates the same restraint in design. The exterior has a facing of Indiana limestone on the first story with dark brownish red brick above. The iron fence and balconies are painted dark green. The plan indicates generous sized rooms and the ceiling of the principal floor is high to contribute to the spaciousness. The excellent scale and dignity of the rooms on this floor may be noted in the view of the main hall. This room has a black terrazzo floor with brass inlay and walls painted a light green color, contrasted with the cream tone of the cornice and trim. The living room is a well studied interior based on English rooms of the period of Wren. The walls have the typical heavy moulded panels and a carved overmantel, worked from pear wood. The paneling is painted a dull green with ornamented members in gold. Furniture and hangings are well chosen to accord in character with the architectural background.

The country houses designed by Messrs. Adler and Dangler are of no less distinction than their city houses. None of the houses illustrated is large, yet they have been successful in imparting to them unusual garden settings, charming vistas and spacious suites of rooms that are ordinarily achieved only in houses of far greater area. The Charles Burral Pike house at Lake Forest shows well the imaginative quality that underlies their work. It is an ingenious grouping of an Italian paved court with a house of modest dimensions that gives an effect of great space. The lot on which it is located is shallow and borders Lake Michigan. The court with solid walls toward the road was designed to afford privacy. The sunken garden at the rear was the foundation of a former house, through which a cut was made



Detail of Entrance Facade on Forecourt
House of Ralph H. Poole, Esq., Lake Bluff, Ill.



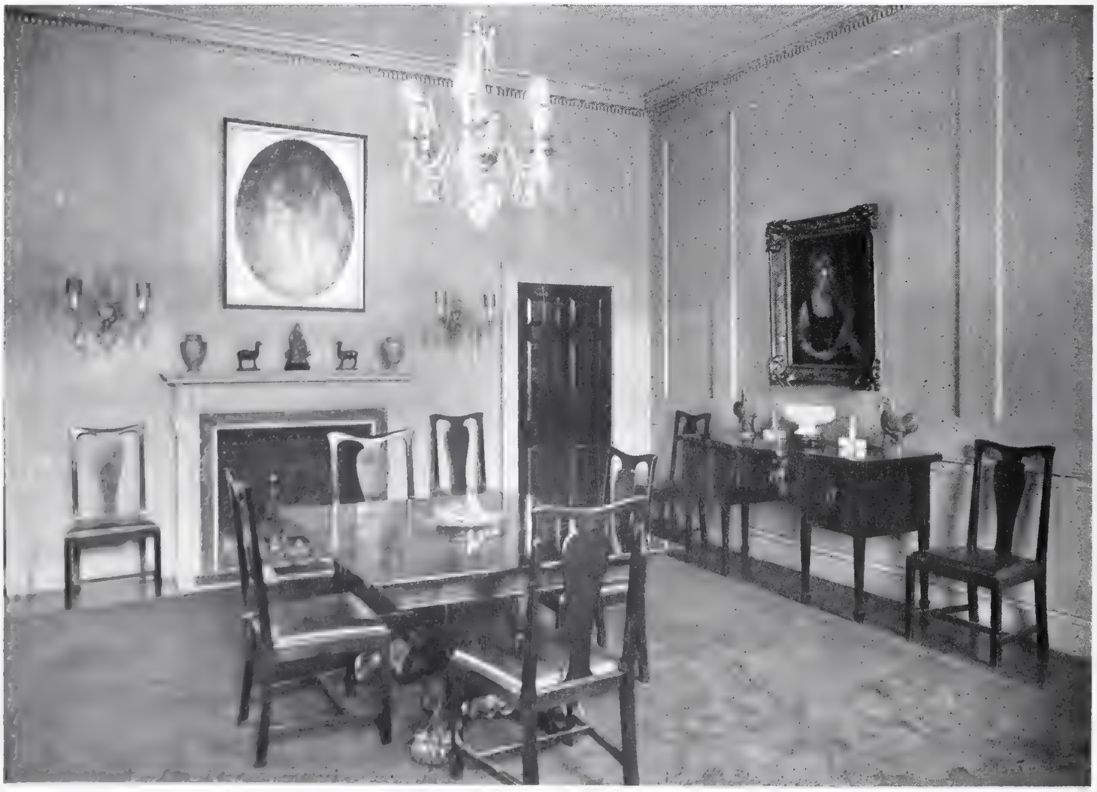
Stair Hall in House of Ralph H. Poole, Esq., Lake Bluff, Ill.

extending it to the lake. The walls of the house are of brick coated with a very thin plaster wash; the trim is Indiana limestone and the roof of pinkish colored tiles. The interiors are patterned after the simple Italian manner with sand finished plaster walls and walnut woodwork, unstained and oiled. The floors in the rooms illustrated are of black terrazzo.

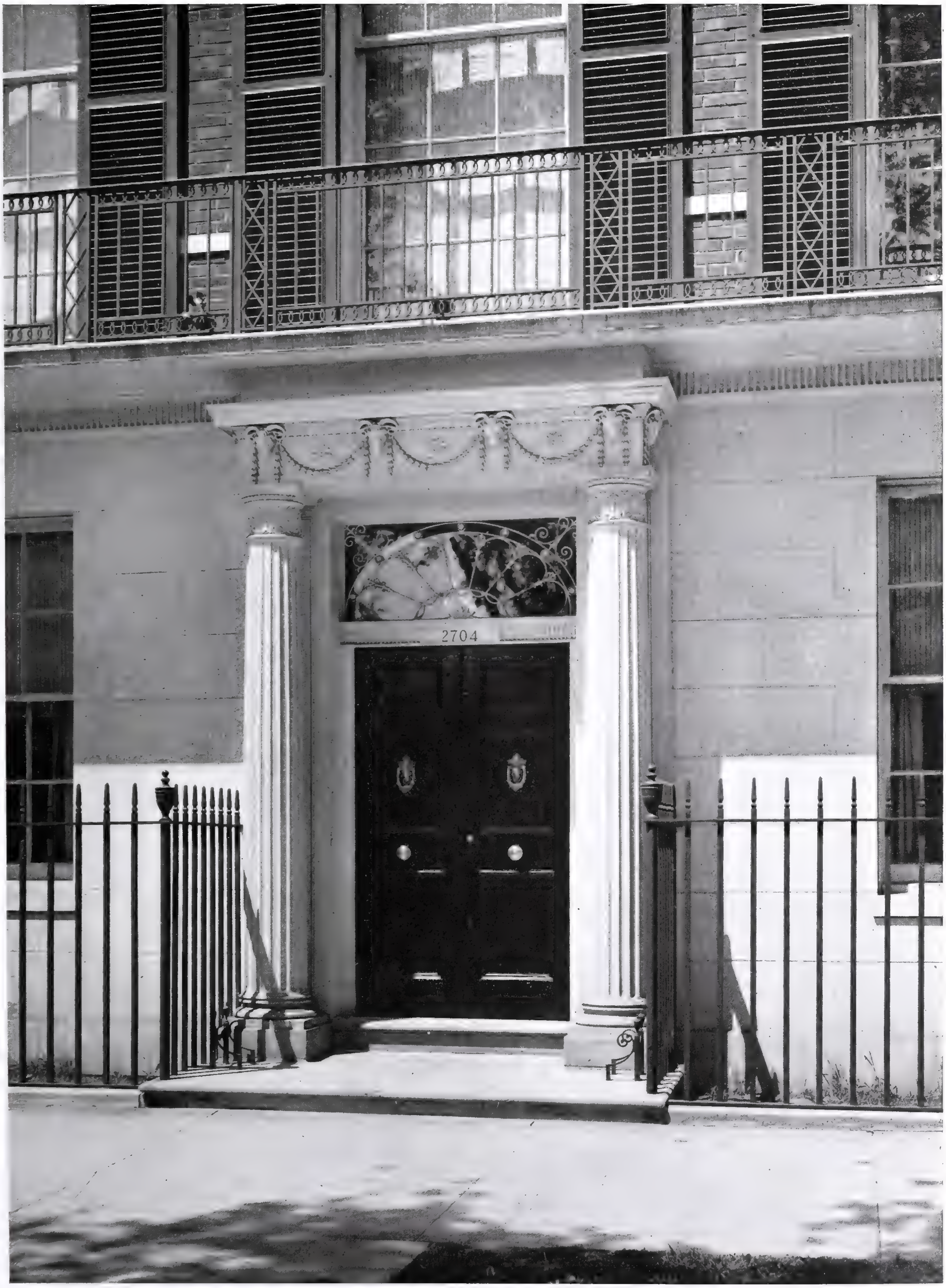
The Louis XV house at Lake Bluff was designed to give emphasis to long horizontal lines because of its position on a ridge of land. The exterior is plaster with cast cement trimmings; the roof is covered with gray slate, and ironwork is painted black. The interiors are decorated and furnished consistently with the exterior and indicate the satisfactory qualities to be gained from a restrained use of Louis XV motifs and details. The library is a small room paneled in natural gum; the music room is partially paneled, the woodwork painted yellow with green lines, the rest of the walls being covered with old yellow damask.

Two interiors from the house of Joseph M. Cudahy at Lake Forest are also shown. These are suggestive of Louis XVI and are excellent examples of the modern handling of this very finished period. The hall is built around a series of old French grisaille paintings with blue borders which are set in the paneling. The floor is black terrazzo and the base marble. The morning room has particular charm with the suggestion of the Empire style appearing in some of the furniture. The walls are painted cream and the floor is laid with hexagonal red tiles.

In all of these houses the interior design and the decoration and painting of walls have been a part of the architectural service, and in many cases the designers have suggested the schemes for furnishing.



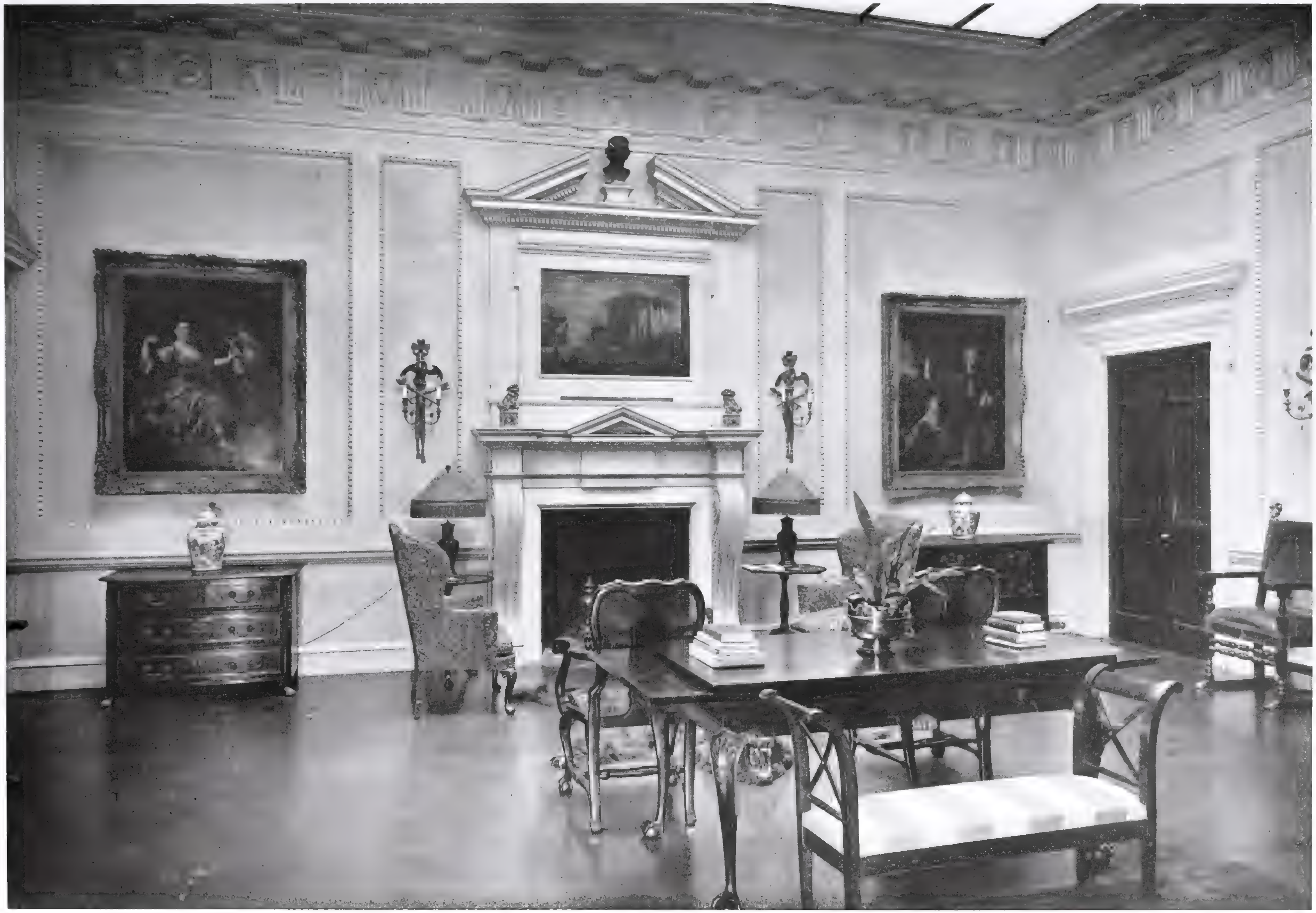
Dining Room in House of Mrs. Arthur Ryerson, Chicago



DETAIL OF ENTRANCE

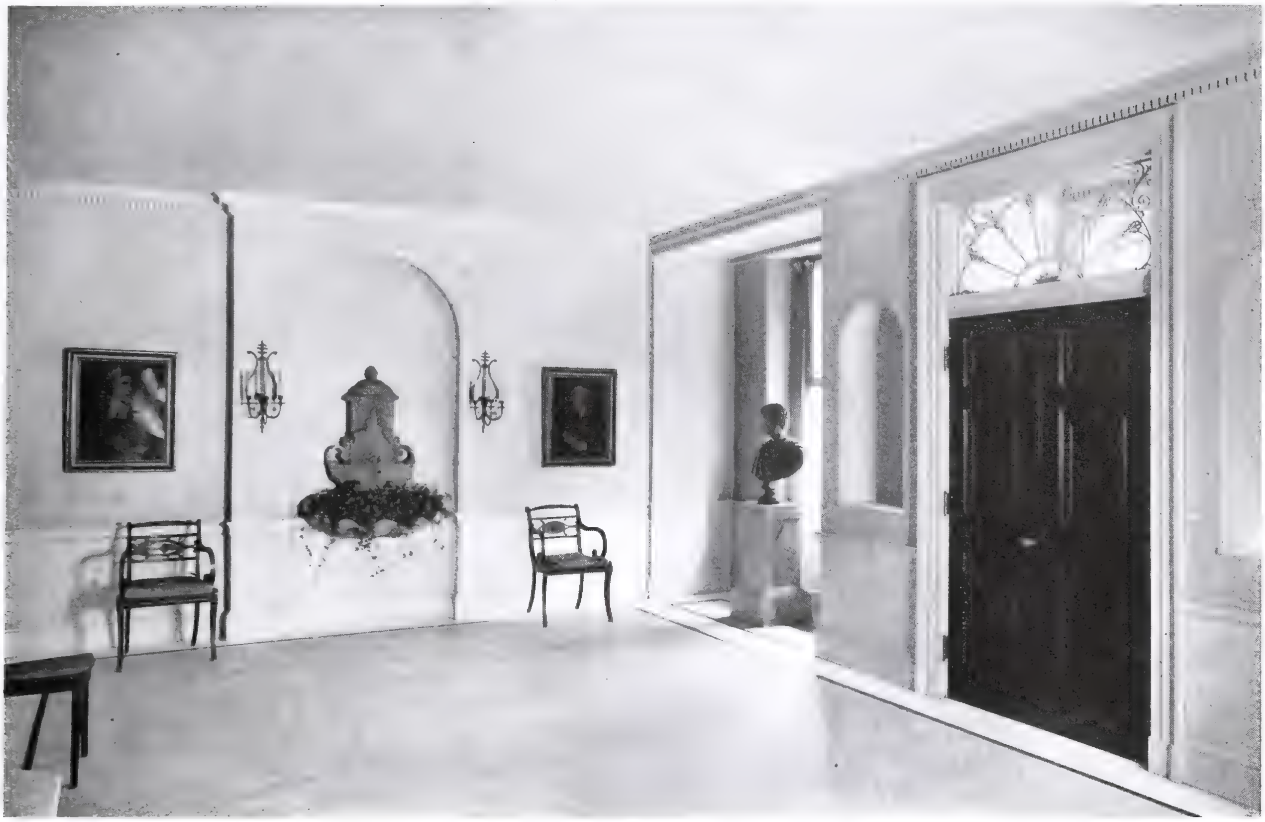
HOUSE OF ABRAM POOLE, ESQ., CHICAGO, ILL.

HENRY CORWITH DANGLER, ARCHITECT
DESIGNED BY DAVID ADLER AND HENRY DANGLER

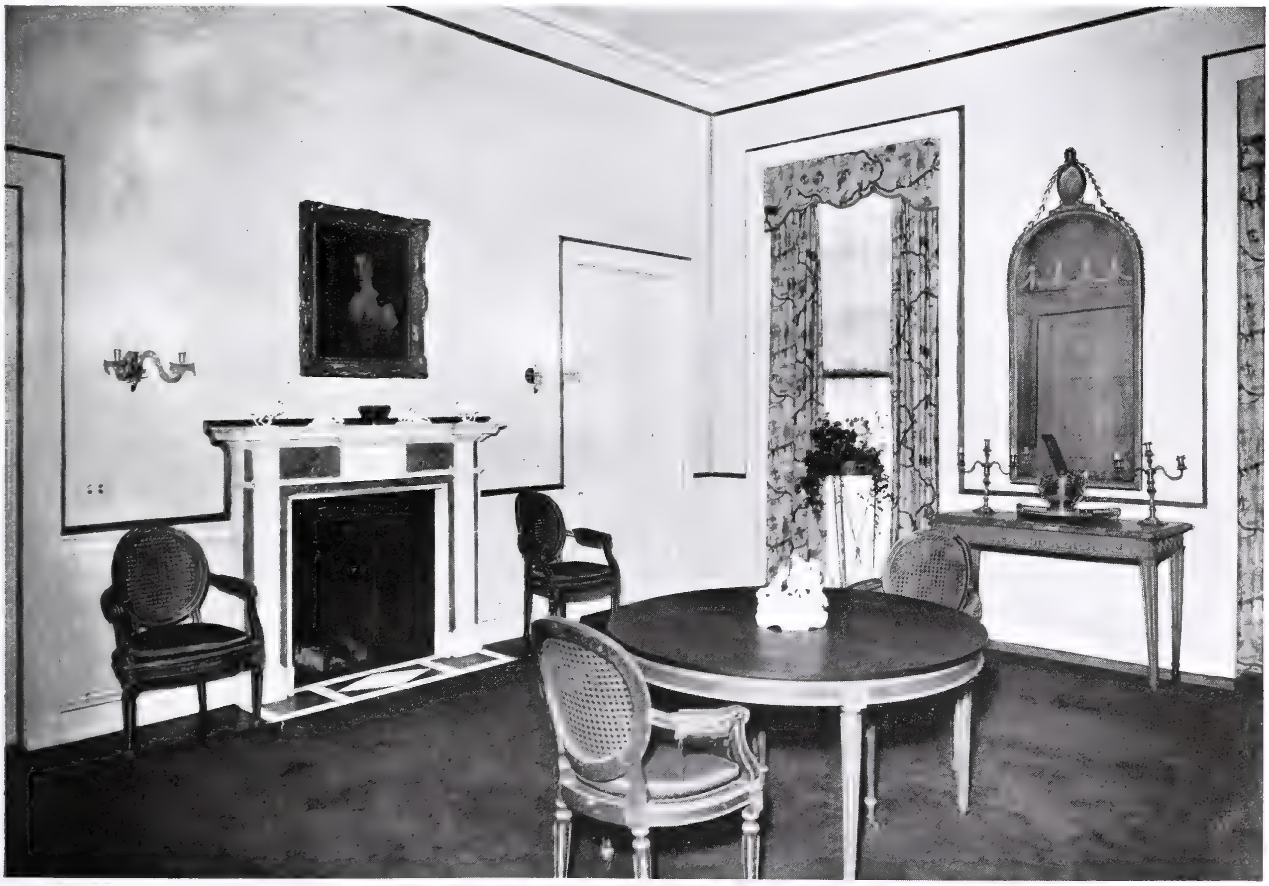


MAIN HALL, HOUSE OF ABRAM POOLE, ESQ., CHICAGO, ILL.

HENRY CORWITH DANGLER, ARCHITECT
DESIGNED BY DAVID ADLER AND HENRY DANGLER



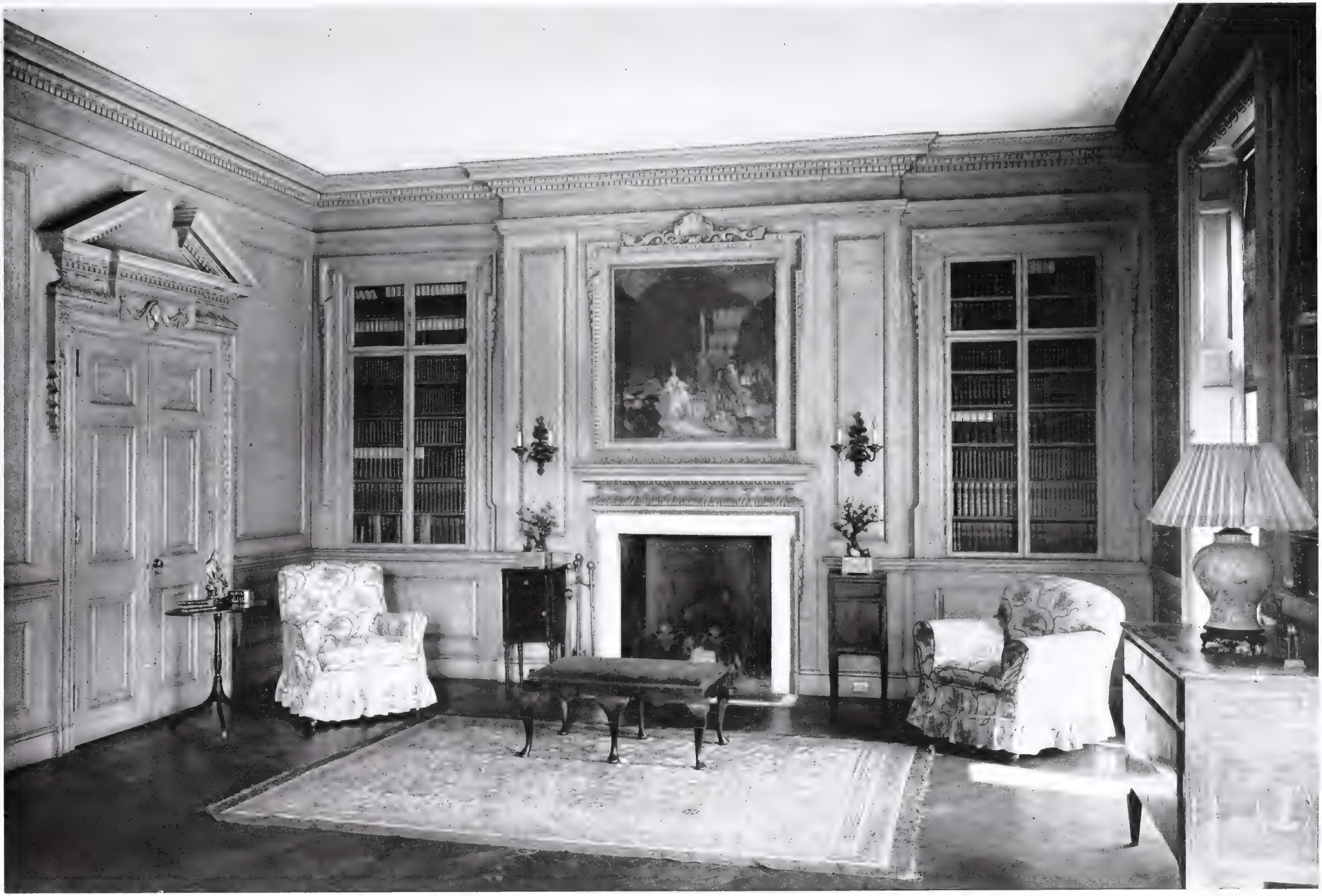
ENTRANCE LOBBY



DINING ROOM

HOUSE OF ABRAM POOLE, ESQ., CHICAGO, ILL.

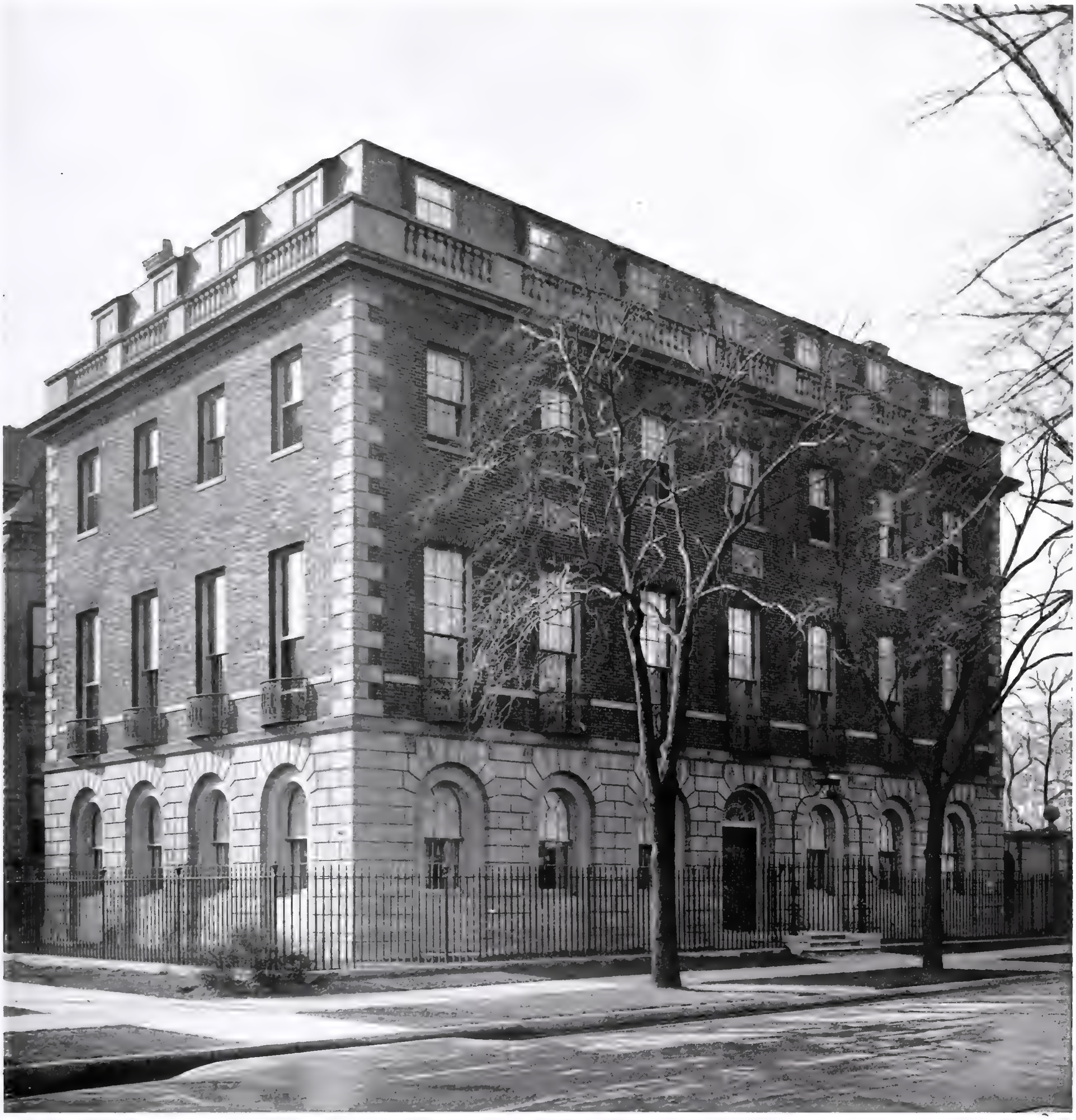
HENRY CORWITH DANGLER, ARCHITECT
DESIGNED BY DAVID ADLER AND HENRY DANGLER



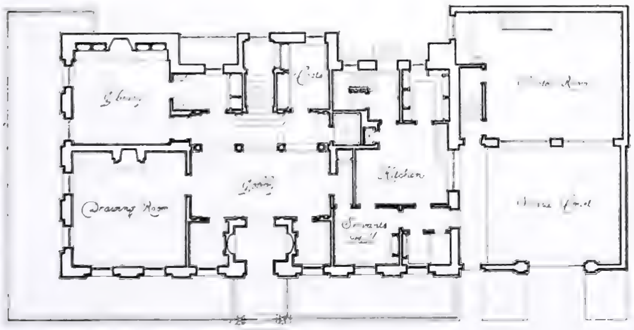
LIVING ROOM, HOUSE OF MRS. ARTHUR RYERSON, CHICAGO, ILL.

HENRY CORWITH DANGLER, ARCHITECT

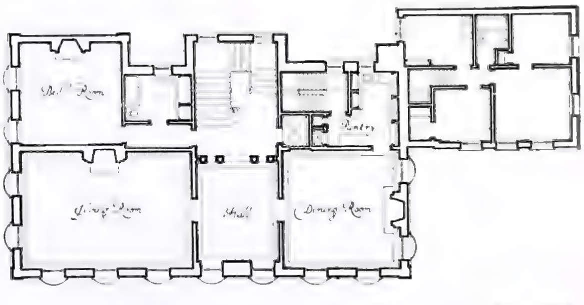
DESIGNED BY DAVID ADLER AND HENRY DANGLER



GENERAL EXTERIOR VIEW



FIRST FLOOR PLAN

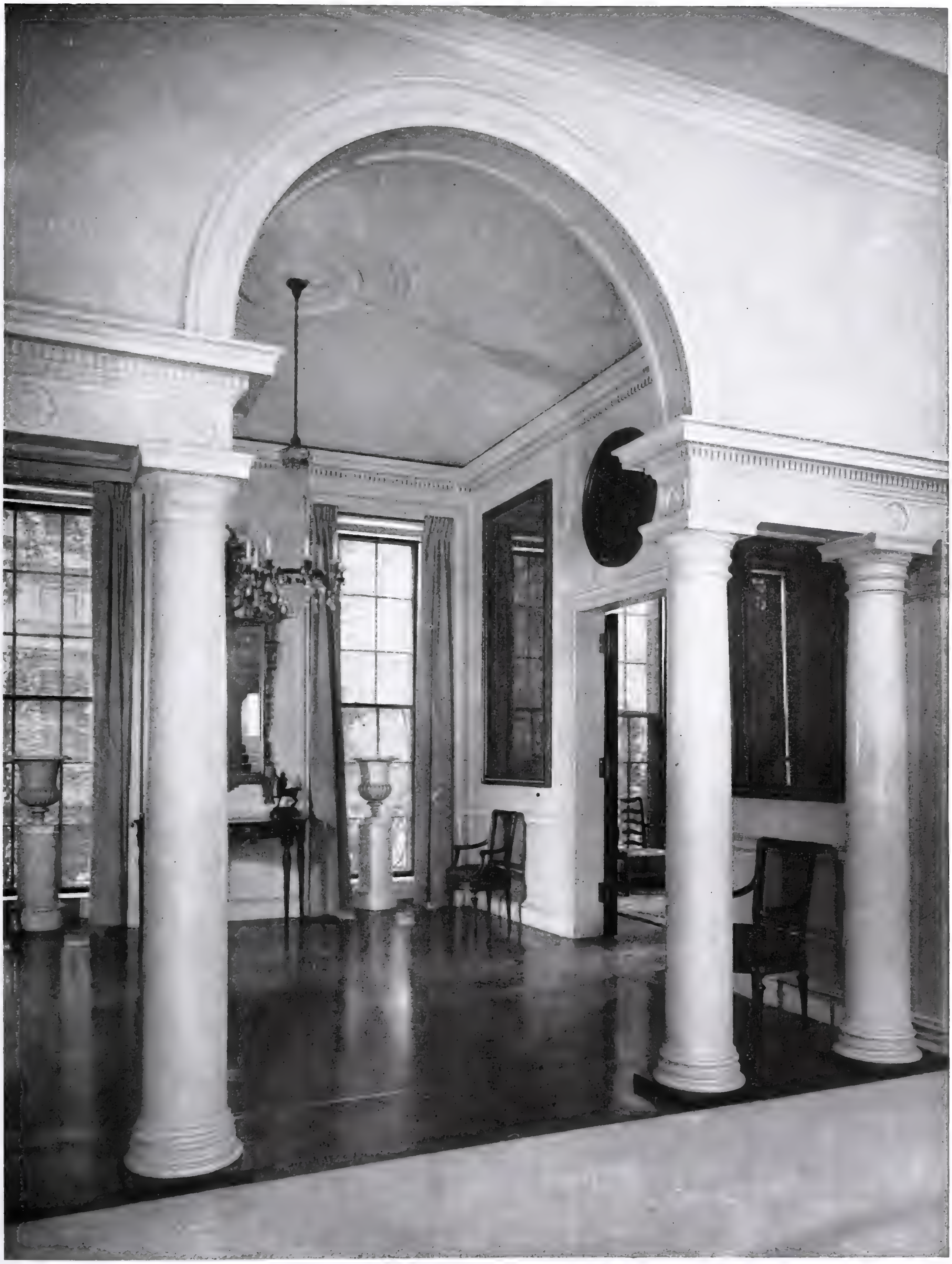


SECOND FLOOR PLAN

HOUSE OF CHARLES G. KING, ESQ., CHICAGO, ILL.

HENRY CORWITH DANGLER, ARCHITECT

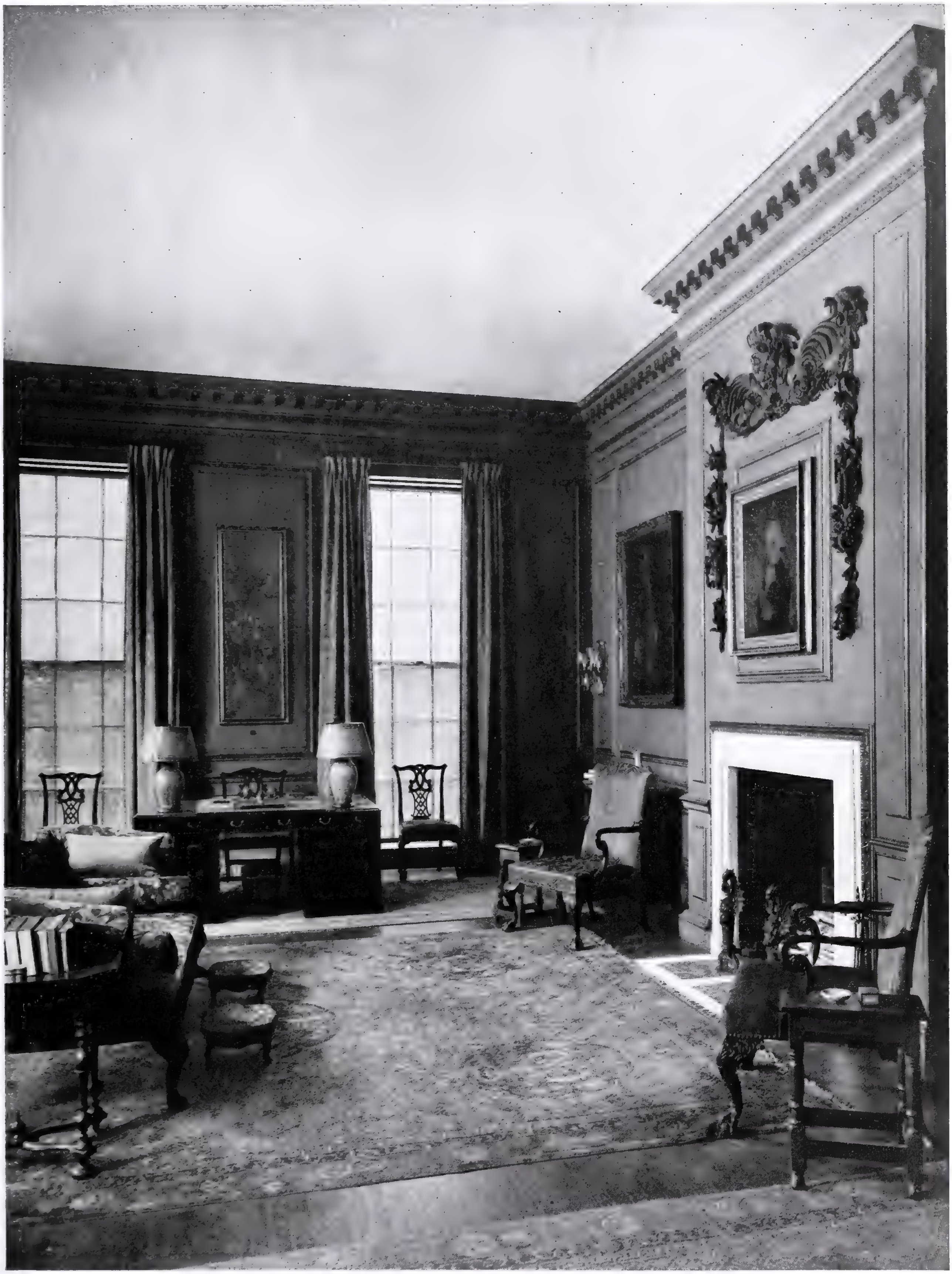
DESIGNED BY DAVID ADLER AND HENRY DANGLER



MAIN HALL LOOKING FROM STAIRWAY

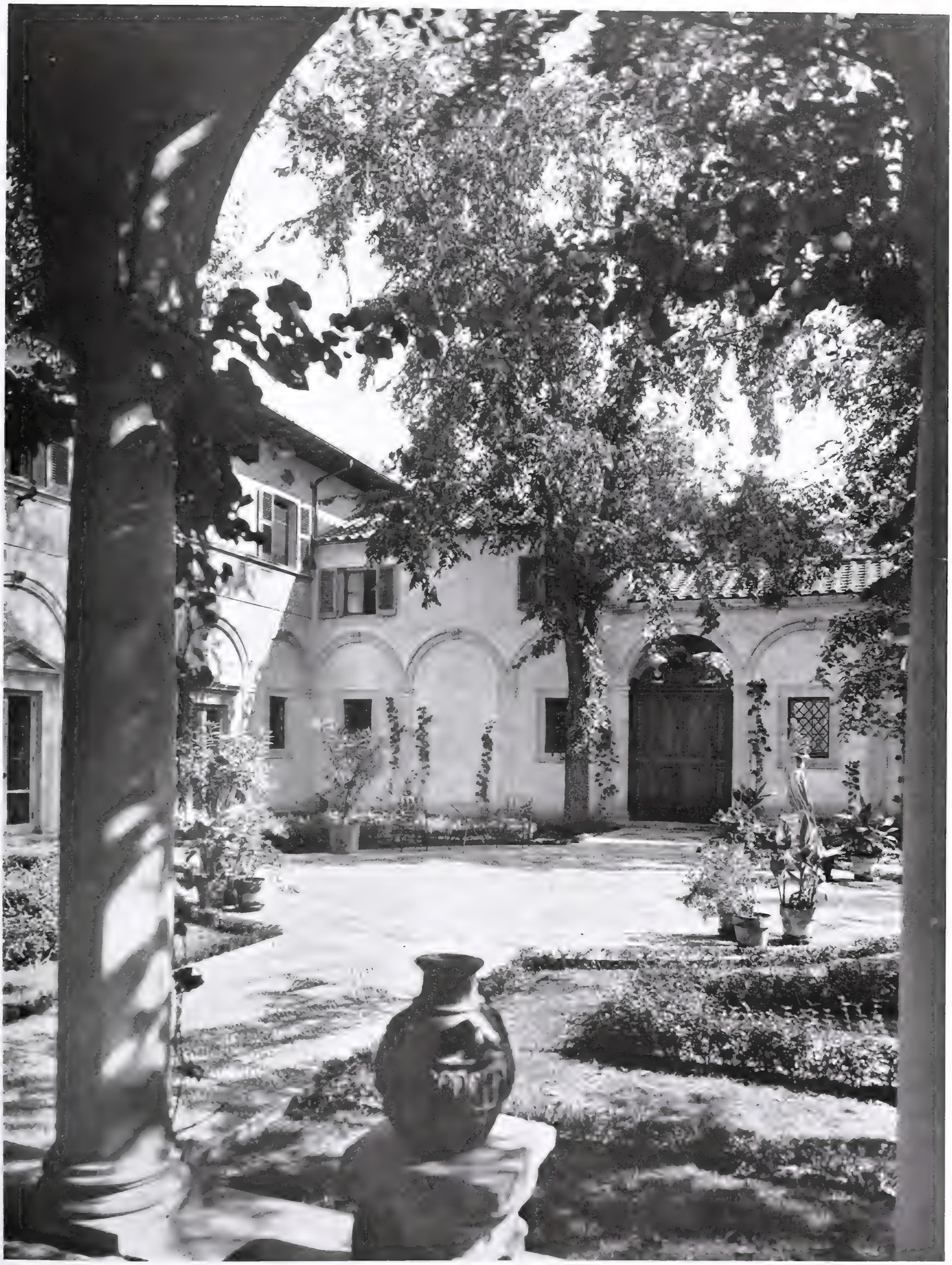
HOUSE OF CHARLES G. KING, ESQ., CHICAGO, ILL.

HENRY CORWITH DANGLER, ARCHITECT
DESIGNED BY DAVID ADLER AND HENRY DANGLER



LIVING ROOM, HOUSE OF CHARLES G. KING, ESQ., CHICAGO, ILL.

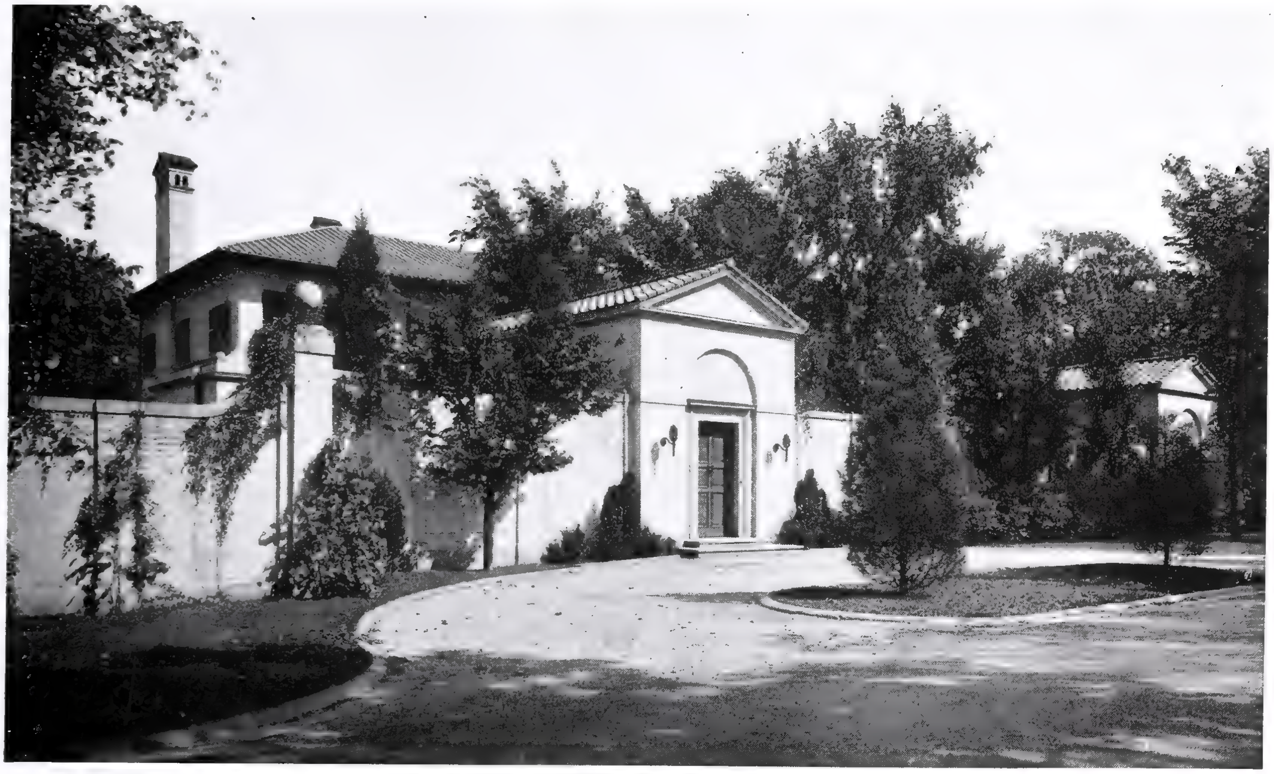
HENRY CORWITH DANGLER, ARCHITECT
DESIGNED BY DAVID ADLER AND HENRY DANGLER



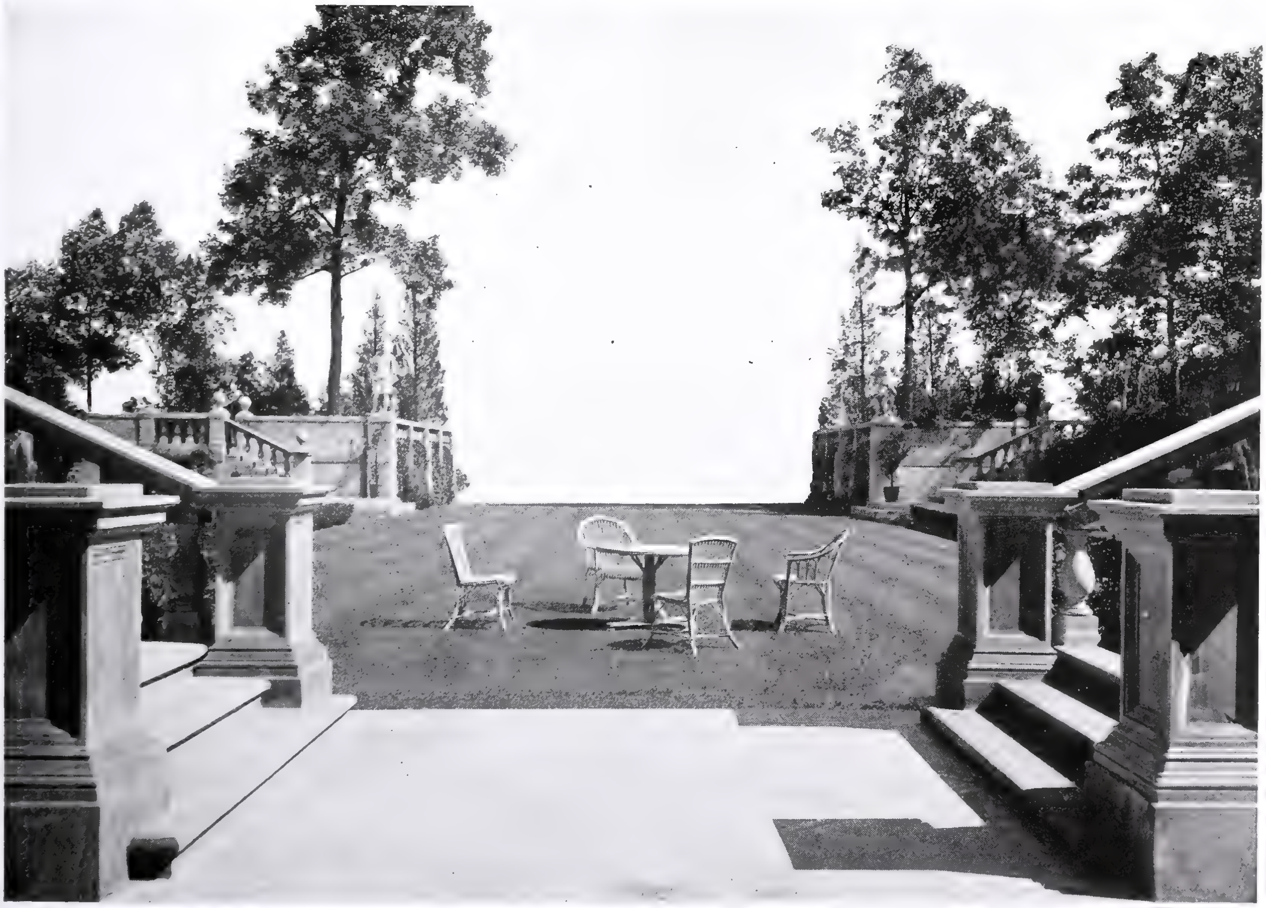
VIEW ACROSS ENTRANCE COURT

HOUSE OF CHARLES BURRAL PIKE, ESQ., LAKE FOREST, ILL.

HENRY CORWITH DANGLER, ARCHITECT
DESIGNED BY DAVID ADLER AND HENRY DANGLER



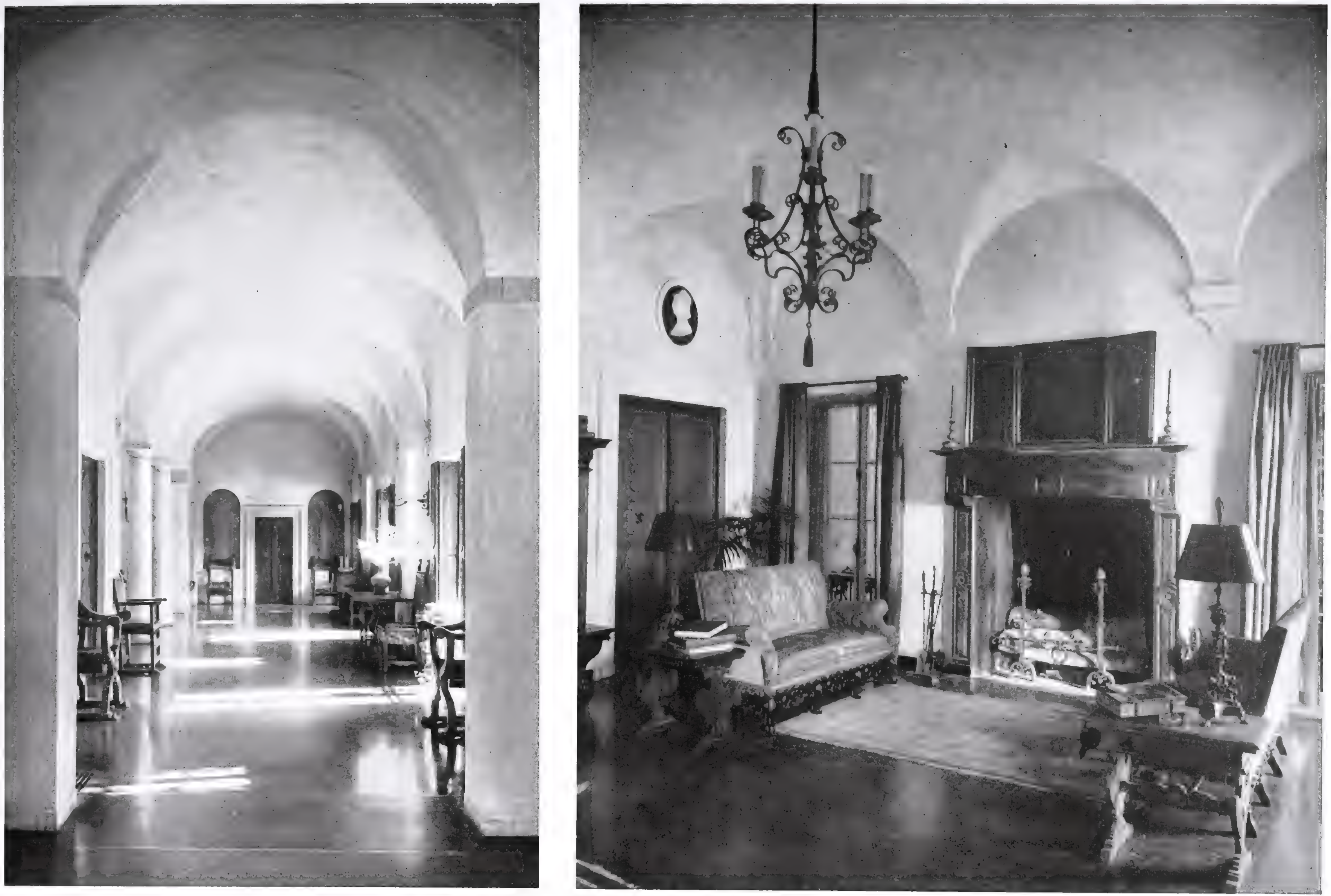
VIEW FROM ROAD



VIEW OF GARDEN LOOKING TOWARD LAKE

HOUSE OF CHARLES BURRAL PIKE, ESQ., LAKE FOREST, ILL.

HENRY CORWITH DANGLER, ARCHITECT
DESIGNED BY DAVID ADLER AND HENRY DANGLER

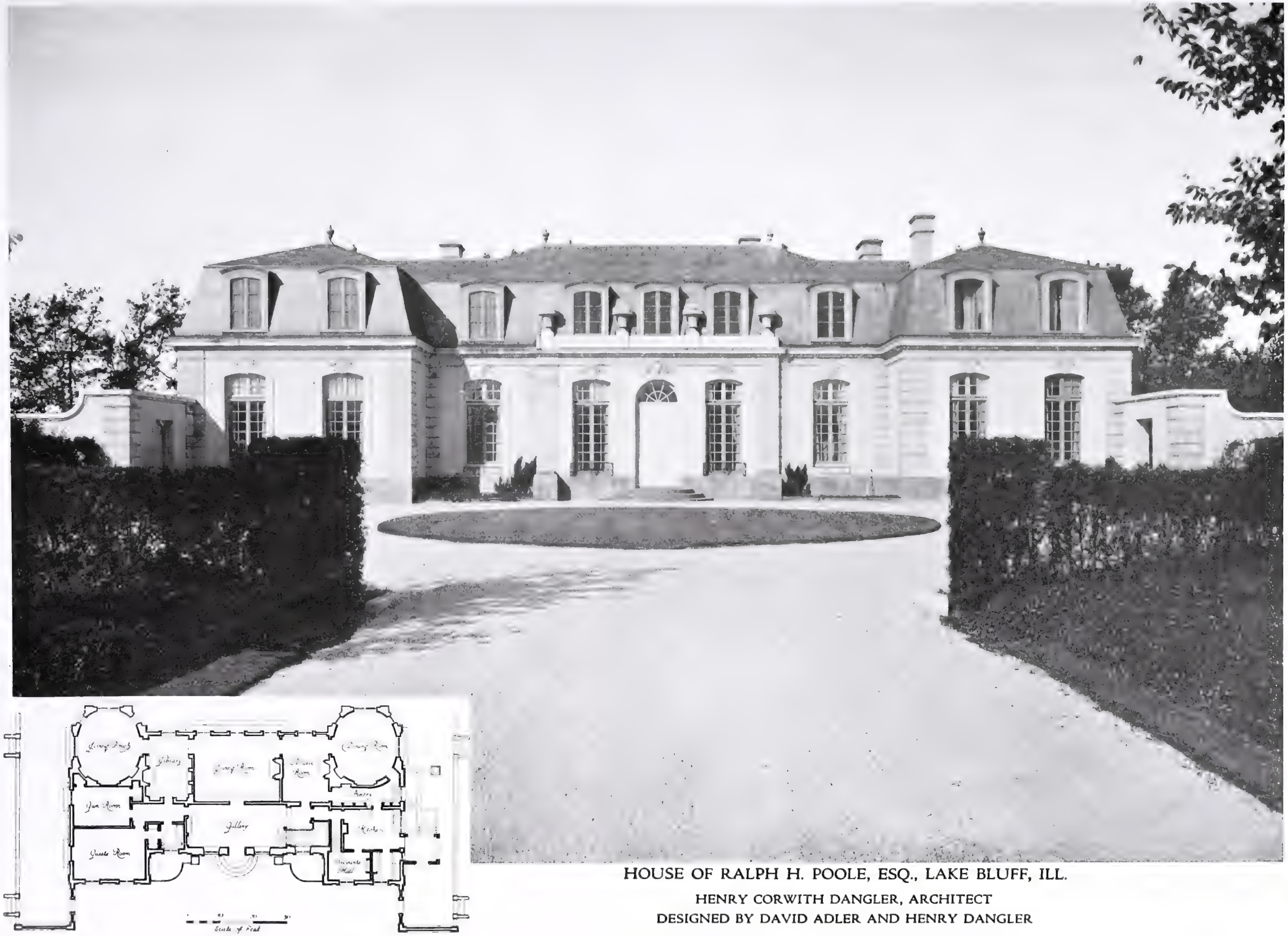


INTERIOR VIEWS OF GALLERY AND LIVING ROOM

HOUSE OF CHARLES BURRAL PIKE, ESQ., LAKE FOREST, ILL.

HENRY CORWITH DANGLER, ARCHITECT

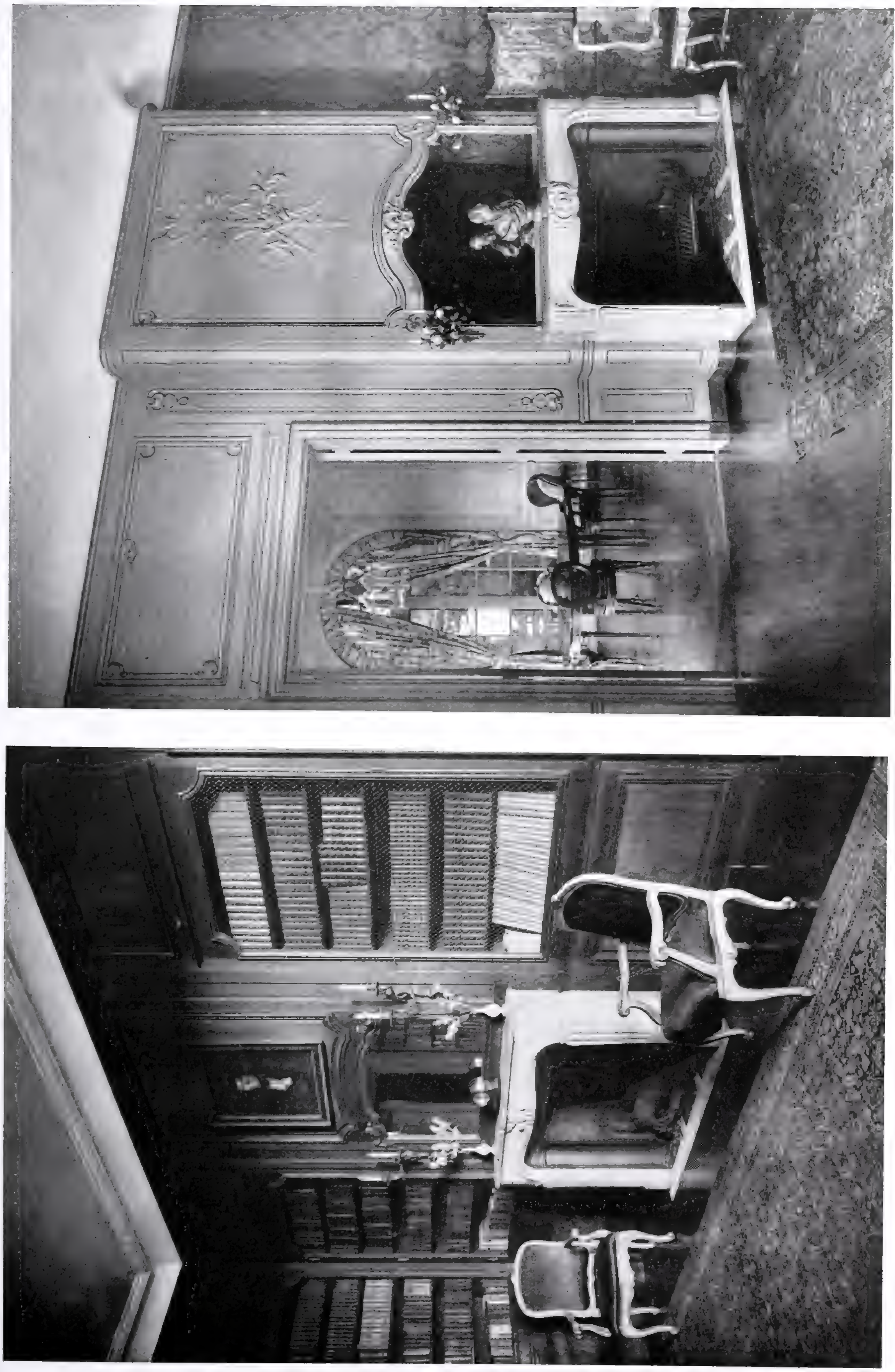
DESIGNED BY DAVID ADLER AND HENRY DANGLER



HOUSE OF RALPH H. POOLE, ESQ., LAKE BLUFF, ILL.

HENRY CORWITH DANGLER, ARCHITECT

DESIGNED BY DAVID ADLER AND HENRY DANGLER

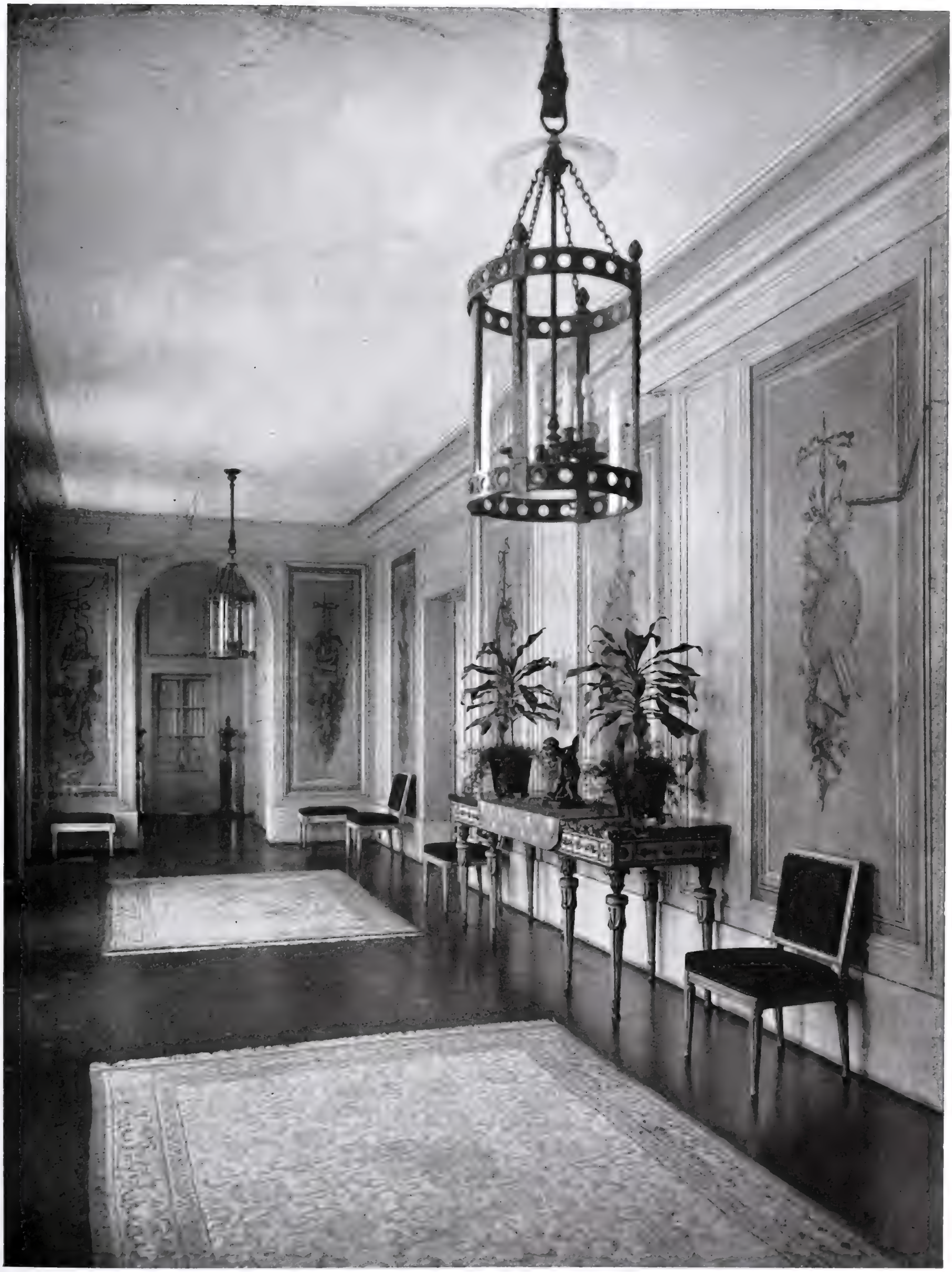


DETAIL VIEWS OF LIBRARY AND MUSIC ROOM

HOUSE OF RALPH H. POOLE, ESQ., LAKE BLUFF, ILL.

HENRY CORWITH DANGLER, ARCHITECT

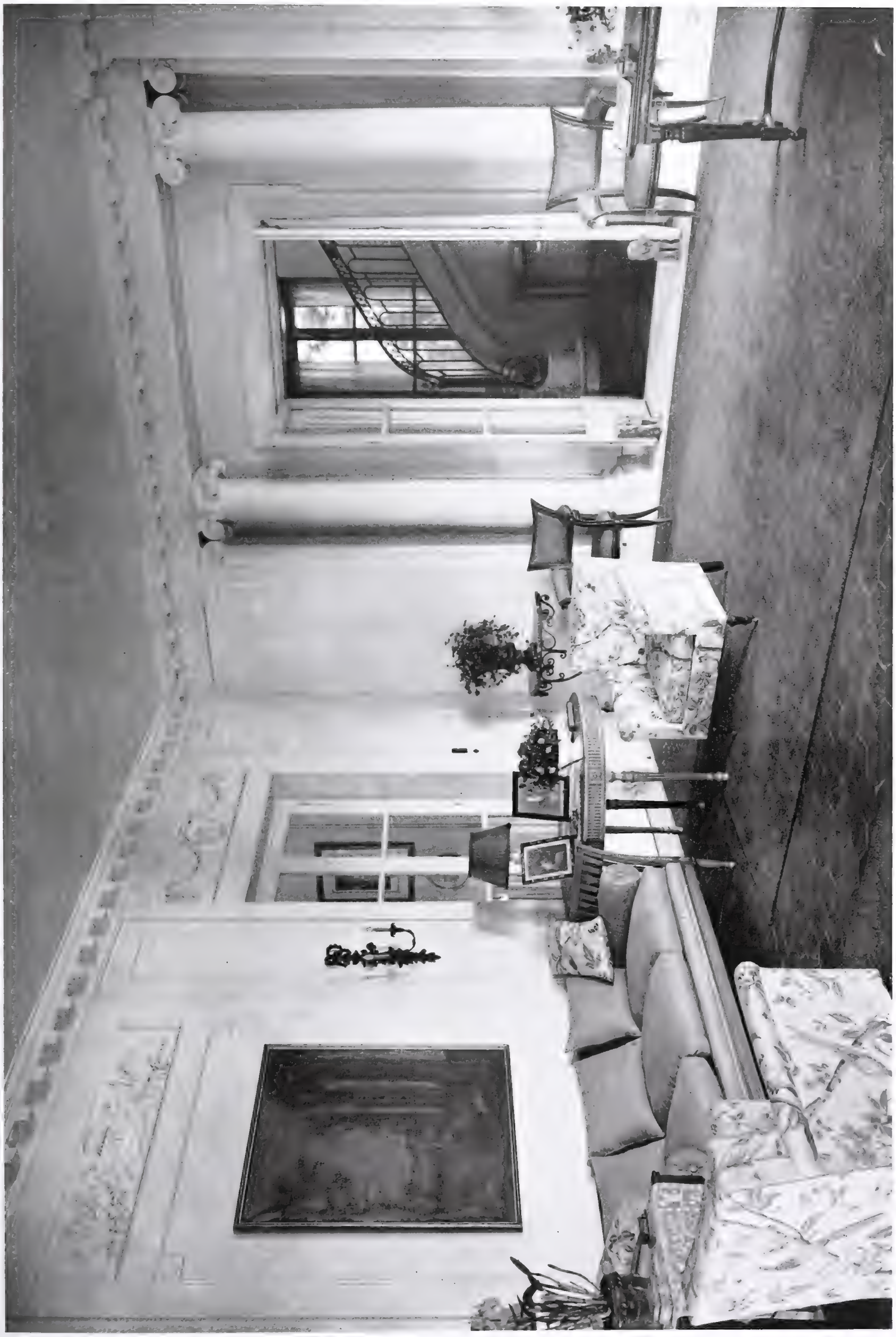
DESIGNED BY DAVID ADLER AND HENRY DANGLER



HALL, HOUSE OF JOSEPH M. CUDAHY, ESQ., LAKE FOREST, ILL.

HENRY CORWITH DANGLER, ARCHITECT

DESIGNED BY DAVID ADLER AND HENRY DANGLER



GARDEN ROOM, HOUSE OF JOSEPH M. CUDAHY, ESQ., LAKE FOREST, ILL.

HENRY CORWITH DANGLER, ARCHITECT

DESIGNED BY DAVID ADLER AND HENRY DANGLER

BUSINESS & FINANCE

C. Stanley Taylor, *Associate Editor*

1922 Should Prove a Good Year for Architects

EVERY ARCHITECT SHOULD READ this article which presents an accurate analysis of conditions affecting the building industry as we enter the period of spring activity. In addition to a review of general business conditions in the field, there is presented an analysis of a recent decree of the Department of Justice which removes any limitation of production on the part of building trades labor and should go far to eliminating unfair practices which have heretofore restricted labor output and forced unequitable conditions upon the building investor and employer. The facts which are given in this article constitute information which will be of direct benefit to clients who at this time are considering investment in new buildings.

THE time has now arrived when it may be definitely predicted that the trend of each of the various economic forces which affects the volume of work in architectural offices is in the right direction to insure activity beginning early this year. Another significant fact is that within the past few weeks a considerable spirit of optimism has been developing among architects. In many offices certain long-delayed building projects are proceeding now, and the attitude of investors in this field promises a large volume of work for architects within the near future. Toward the end of last December the writer visited a number of cities throughout the East and Middle West for the purpose of discussing general conditions with architects. Early in March the same territory was covered again and he was frankly amazed at the change from discouragement to optimism. Many of the offices which were slack three months ago are quite busy now and no dissenting report was found regarding the encouraging outlook.

In regard to the improvement in general business conditions, it seems to be the consensus of opinion on the part of authorities in the world of business and finance that we have turned the corner and that by the fall of 1922 this country will have entered a season of mild prosperity, to be followed by several good business years. As this fact becomes more and more evident it is apparent that the confidence of building investors is being restored and that the volume of building construction will be increased through preparations for greater business activity.

A study of the chart shown on the first page of the Service Section of this issue of The Forum indicates that building costs have become sufficiently stabilized to encourage investors. It is also important to note that the first two months of 1922 show a volume of prospective building in the form of plans filed which is more than half again greater than in the similar period for 1921. Starting, therefore, with this sound foundation of improved general business conditions, we may analyze in some detail the factors which directly affect the volume of building and particularly the volume of work which will pass through the architectural offices of this country during the period immediately ahead.

Active Types of Building Projects. The Forum Survey of Prospective Building Activity for 1922 (described in November, 1921 issue) has indicated an unusual amount of planning for schools, hospitals, churches and other institutional buildings; public and semi-public structures; residential buildings, particularly of the apartment house and apartment hotel type; hotels in smaller cities and towns, and automotive buildings, including public garages and sales buildings. While industrial structures will not contribute as large a quota of new construction as in the past, it may be noted that of the volume of industrial construction to be carried out a larger percentage than ever before will pass through architects' offices. This is in view of the demand for a better class of buildings to be constructed by conservative industrial organizations. There will be little industrial expansion of the mushroom growth type, which has characterized the past four or five years, because general prices have been forced down to a point where the industrial field offers no unusual speculative inducements.

The year 1922 will probably be marked by a great reduction in the number of building alterations in larger cities. The reduced cost of new construction tends to discourage extensive alterations and to encourage improvements of a permanent nature in the business districts. In our larger cities architects may expect, therefore, a certain volume of business in the form of department store extensions and improvements, new office buildings of medium size, warehouses and water front improvements and general building activity in every section of any city which has recently been opened up by new transportation facilities.

Building Finance for 1922. One of the important controlling elements, which also shows encouraging signs at the present time, is that of building finance. A canvass of conditions among the more important loaning institutions indicates that larger sums are available for building loan and mortgage financing than at any time since early in the war period. This condition fundamentally reflects the return of public confidence in the building field as an outlet for investment funds. Those financial organizations which make a specialty of the sale of mortgage investment bonds report an ample supply of funds. In fact, in the larger cities many such institutions are actively advertising mortgage money and are seeking good mortgage investments, having more money than they are able to place.

The entrance of the trend line of building cost into the zone of stabilization is reflected by increased confidence on the part of loaning institutions, and loans are being made on a more liberal basis of appraisal than during the past year. Naturally, every point of decrease in the cost of building construction is to the advantage of the investor and the speculative builder in the reduction of necessary equity for new construction projects. During the period of high building costs appraisals for mortgage purposes were maintained on a very conservative basis, making full allowance for the depreciation in reproduction value of buildings. This has meant that in the past two or three years it was necessary for the building investor to provide an unusually large percentage of his cost as equity.

With the decline in construction costs, however, there has been such a marked decrease in the ratio of necessary equity to total land and building cost that the first healthy signs of speculative building activity have developed, particularly in the various classes of buildings which constitute dwellings. Of these the projects which have been of chief interest to architects are groups of dwellings, apartment houses and apartment hotels. The fact that a heavy buying movement will be uncovered with an additional decrease and an easing up of the mortgage market has already been indicated by what happened in New York when the two factors of decreased cost of building and tax-exemption on new buildings emerged into activity in the late summer and fall of 1921.

A study of building activity in New York gives an unusual opportunity to dissect the development of a building boom and to determine at what point the architect benefits as the volume of construction increases. In New York after the passage of the tax-exemption measure there were at first signs of activity only in the inexpensive residential class where tax-exemption encouraged a number of rent-sick individuals to own homes regardless of the prospective decrease in construction costs. During this period a few speculative builders, encouraged by the absorption of a large proportion of existent housing by the buying public at exorbitant prices, proceeded to build on the assumption that a market would be found regardless of cost. Unfortunately, the buying public did not respond very strongly to new dwellings made available on that basis, largely due to the fact that having already seen a steep decline in general prices, a veritable "buyers' strike" developed in the housing field. Such builders were left high and dry as the tide of cost receded rapidly during the spring and summer of 1921.

On the other hand, toward the base of this sharp decline in costs (see chart on first page of Service Section) a wave of speculative building developed. At this time the type of speculative builder who entered the field was bent on cutting corners in every possible manner. Among other items which were often cut out on a basis of false economy were architects' fees. This phase of the development of building activity introduced into New York a large volume of inferior and poorly designed construction, particularly in the apartment house and moderate cost residential field. From the speculative builder's viewpoint, because of the unusual pressure for housing, this activity was fairly successful. It was still possible to get high rents in these new buildings and to sell them to investors at high prices based on rent rolls which promised excellent investment returns. The fact is, however, that this class of construction will suffer heavily at a later period when the housing shortage is less acute, because the public will then be given an opportunity to select living quarters rather than be forced to take the first vacant apartment or house which may be available. This will bring into competition the better designed and better constructed buildings which are now proceeding under construction or are in various stages of planning. Undoubtedly, the flimsy and poorly designed buildings of the earlier period of 1921 will suffer in valuation and there will probably be a considerable money loss for investors who attempted to capitalize the housing shortage and to provide living quarters of minimum value at maximum cost to the tenant.

In the fall and winter of 1921, however, a different class of speculative buildings has been entering the residential field. This class includes a large number of carefully designed apartment buildings in which some thought has been given to architectural planning and to a better type of building construction. Here the valuable effect of architectural planning is quite noticeable and the ultimate comparison of the buildings built from good architectural plans with those constructed on the basis of false economy earlier in the year will be one of the best arguments yet presented to the investing public as to the value of architectural services.

The development of these various stages of residential building in New York may be applied generally throughout the country. As costs have come down a wave of cheap speculative building has been and is sweeping the country, particularly in connection with housing and community utility buildings. We may note, however, that already in some of the western cities a reaction has commenced in favor of the architect and that the secondary wave of building activity, reflected in plans filed in January and February, calls for better built and better designed structures than in the primary wave which developed in the late summer of 1921.

The result of this reaction has undoubtedly been felt by loaning institutions. We believe that thoughtful consideration on the part of such organizations is now being given to the importance of efficient planning and good design as affecting buildings which constitute collateral for loans. In other words, it looks very much to us as though architecture during the next few years will be a much more important factor in building loan appraisals than ever in the past. *The architect himself can do much to bring about this desirable condition, first,* by making more careful study of building finance as affecting the districts in which he works, and, *second,* by developing a closer contact with loaning institutions in order better to determine their requirements and thus render a more complete service to clients.

The architect has much information which would be of benefit to any loaning institution, and it is certain that a more comprehensive knowledge of the attitude and requirements of loaning institutions would be of great benefit to the architect and consequently to his client. This fact is proved when one learns that not one out of 20 building and permanent mortgage loans is made by leading loaning institutions of this country without their suggesting and insisting upon changes in the plans submitted!

THE BUILDING INVESTOR'S VIEWPOINT. The prospective building investor has naturally been considerably bewildered by the unusual fluctuations in building costs and demand. When the period of general deflation began about two years ago, the public watched with interest as prices dropped rapidly in various classes of necessities and luxuries. It was but a natural assumption that there would be a considerable decline in the cost of building. This decline took place until late in the fall of 1921 when building cost developed some aspects of stabilization. It has been difficult, however, for the building investor to realize that a period of stabilization is setting in and that by building within the near future he will not be risking a further great depreciation in replacement values. Gradually, however, this realization is developing and the building investor is gaining confidence which will probably be expressed in an increasing volume of work in architectural offices.

The ironing out of labor difficulties, as explained in later paragraphs in this article, together with the encouraging attitude of loaning interests, is having much to do with the return of confidence on the part of the building investor. It must be remembered, however, that in making his investment he will look to the architect for a comprehensive type of service. He will insist as never before that his building be thoroughly efficient in plan and that it shall be built on a minimum cost basis but without sacrificing too greatly the quality of materials and equipment.

As never before, the building investor will appreciate the co-operation of the architect in the introduction of expert service for special problems connected with the building. Thus in the design of office buildings and other investment types, the viewpoint of the building manager who is to be responsible for maintenance and renting should be sought eagerly by the architect before final plans are completed. Unless through some unusual combination of circumstances he may have had extensive experience in building management, there is no architect today who can design a commercial building that could not be improved by valuable suggestions from an efficient building manager. *Millions of dollars have been wasted in buildings throughout this country during past years because those who are responsible for design and equipment have not been brought in contact during the period of planning with those who are responsible for maintenance and income.* It is a significant fact that there is scarcely an office building in the United States in which the manager would not make drastic changes in plan and equipment if he were able to do so.

What does this mean from the investor's viewpoint? It means that whenever an architect may have cause to introduce a specialist in connection with some phase of planning and equipment, he will gain and merit the appreciation of his client. In fact this is the kind of service that he will rapidly learn to expect from his architect—a service reflecting a deeper appreciation of the owner's business viewpoint and the financial success of his project.

Again, in the construction of his building, he will appreciate buying skill which may be shown by the architect. In other sections of THE FORUM we have already called attention to the fact that in this period of keen competition between general and sub-contractors and in the material market, there is open to the architect an opportunity for skillful buying such as he has never known before. It is quite surprising how much can be cut from the cost of a building today by carefully combing the field for sub-contract bids and by willingness to change specifications to meet opportunities for saving which may be suggested by contractors or salesmen of building materials, devices and equipment. The architect who studies the building field carefully today, who welcomes the salesman as a friend and ally rather than receiving him grudgingly as a time-consuming pest, who studies the ways and demands of the speculative building field, and who becomes better acquainted with bankers and loaning institutions, is the architect who will reap his reward in the years of activity to come because he will look at every project which comes into his office through the eyes of the building investor who may be his client. In this way only can he render true service and develop a sound reputation among building investors in his locality.

An interesting substantiation of this viewpoint has recently been given by Leonard P. Ayres, Vice-president of the Cleveland Trust Company, in an address before the annual meeting of the Associated General Contractors. (In the Service Section of this issue of The Forum will be found a complete analysis by Colonel Ayres of the extraordinary future of the construction industry.) In the course of his address he makes these interesting remarks:

> "For business men in this period of competition are going to demand value; they are going to shop when they make their purchases in construction, just as they are in every other commodity. *That man, who can hand over to them a larger inherent worth for the investment, is the man who is going to reap his reward in this competitive period that is upon us*—a period, I think, in which that man is going to succeed and those firms are going to survive that practice this sort of foresight that we have been talking about, that are able to exercise a wise thrift, that can increase the efficiency of the management of their concerns and, most of all, that know or get to know the fundamental facts about their business, that have the ability and the will to substitute facts for guesses and knowledge for opinions and evidence for speculation.
>
> "For that man or firm, in the construction industry, a very hopeful future exists. And, gentlemen, that is what I think about the construction industry in 1922 from a banker's viewpoint!"

Speculative Building and Architectural Service. We have already referred to the increasing use of architectural service by speculative builders in the second stage of the building boom in New York and vicinity. An examination of conditions in the speculative building field in other large cities throughout the East and Middle West shows an increasing amount of speculative work under design through architectural offices. One of the principal reasons for this condition is that speculative building ventures are now being undertaken by a more conservative and more businesslike class of investors who realize that their buildings must be designed to meet the keen competition which will follow in later years.

In order to make his service of value to the speculative builder, the architect must be in a position to make an exact study of rental and maintenance efficiency. He must also consider seriously the introduction of the element of architectural design through the use of simple forms and through the relation of structural masses and proportions rather than by expensive embellishments. In the field of speculative apartment house construction, it may be noted that within the past few months a number of architects have developed unusually good reputations and large volumes of business through their skill in designing attractive buildings with layouts promising maximum rental returns and minimum overhead costs. If an architect proposes to enter this field he must make a study of building financing, the local rental market and the market for materials and equipment, so that he can offer to the speculative builder efficient plans in which architectural design is not over-emphasized by an increase in cost of construction and which provide rentable areas showing the highest possible market value. He must also keep closely in touch with developments in the field of utility equipment so that he can introduce the maximum number of features which will attract and hold tenants. The same conditions hold true for other types of buildings which may be considered in the class of speculative investments.

Cutting the Claws of Building Labor. One of the most important events which has taken place recently in the construction industry is the agreement made last month between the United States Department of Justice and the International Union of Bricklayers, Masons and Plasterers. As formulated by the Department of Justice, this agreement, which is virtually a decree, contains these provisions:

"1. There is to be no limit to the productive capacity of the individual workman within the working day or any other time.

"2. There is to be no limit upon the right of the employers to purchase their materials wherever and whenever and from whomsoever they may choose, whether these materials be union-made or otherwise.

"3. There is to be no favoritism shown by organized labor toward employer or trade associations, and no discriminations are to be indulged in against the independent employer who may not be a member of such an organization.

"4. The labor organization is not to be used, or permit itself to be used, by material men or contractors or sub-contractors as an instrument for the collection of debts or enforcement of alleged claims."

It is of particular importance to note that this agreement establishes new working rules for approximately 119,000 union workers, and that any member who violates a provision of the decree "will be guilty of contempt and subject to both fine and imprisonment."

While this decree does not insure that all building jobs will proceed on an honest and fair basis, it is evident that it opens up an opportunity for fair minded employers and for employes who wish to give real service, to proceed in harmony without fear of the vicious, undermining influences of crooked labor leaders and lazy workmen. This action is the gratifying outcome of many efforts such as that involved in the Landis decision, and the unearthing of conditions in the New York building field by Samuel Untermyer.

The Trend of Building Costs. A survey of all conditions affecting building costs and a study of the trends of these various factors would indicate that we are facing a period of very gradually declining costs, marked by certain fluctuations effected during periods of unusual demand.

What prospective building owners need now is definite information which will aid them in the realization that a period of stabilization has actually developed in the building industry. The architect is the logical person to convey this information to his client, and it is for this reason that he should be interested to an unusual degree in the economic phases of building construction.

ALSATIAN IRONWORK

A GROUP OF MEASURED DRAWINGS

By HOWARD MOÏSE

THE ironwork of Alsace, while certainly less distinctive and individual than the definitely characterized ironwork of France, Italy or Spain, has nevertheless a distinct character of its own. It is a character derived from the mingling of French and German influences, and no phase of Alsatian architecture records more clearly the long Franco-Teutonic struggle for the domination of the plain of Alsace and the long interaction of French and German traditions on the art of the country. Serving through the centuries as a highway between Germany and the Low Countries on the one hand, and Burgundy and the South on the other, Alsace has inevitably developed art forms which show a mingling of the two currents which met in its cities.

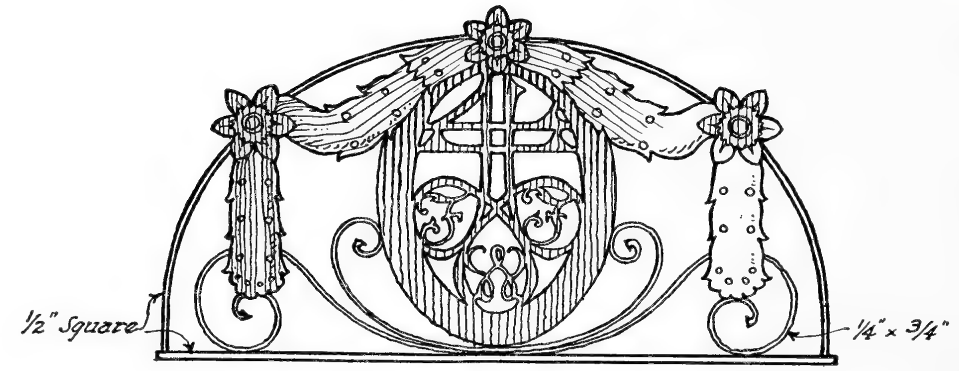
Strasbourg is very rich in ironwork of the eighteenth century which, though essentially French in character, possesses a quality all its own from the handling of the French motives with a certain naive freedom and picturesqueness that is wholly German. The little over-door from a baker's shop is an example in point. Here in the midst of a delicate and charming French motive two gilded lions hold a pretzel in their paws.

Sixteenth and early seventeenth century ironwork are not often met with in the streets, but many interesting examples, such as the cemetery cross, are to be seen in the museums of Strasbourg and Colmar. The explanation of the purpose of the little iron box with a hinged door in the center of the cross is of interest, whether or not it be correct. According to the custodian of the museum its function was to serve as a depository for the cards of visitors to the grave. The emblem suggesting a turtle's back suspended from the seventeenth century sign bracket is also puzzling until one learns that the seven bulges represent mountains, and that the inn before whose door it hung bore the title, "Zu den Sieben Bergen."

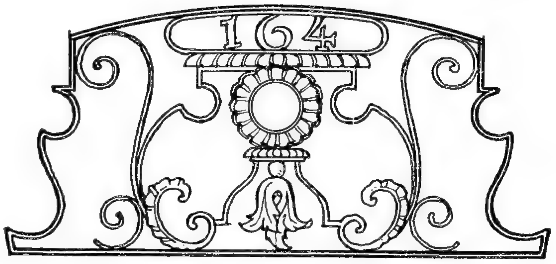
Gothic ironwork is even more rarely met with, but here and there a few late Gothic grilles remain in the transoms over doorways. A favorite pattern is a simple grillage of sixteen squares, the four central squares adorned by a circle from which spring four berries, suggesting a highly simplified laurel wreath.

Almost more interesting than the wrought iron designs, however, are some of the simple metal signs which one finds in the villages and small towns. These are no doubt of fairly recent date, probably early nineteenth century. The wrought iron brackets are of extreme simplicity, but they are often marked by great beauty of line. The sign itself usually consists of a wreath, either round or oval in shape, made up in the round, of little laurel leaves each cut from a separate piece of sheet metal and bound together by metal ribbons at top and bottom. Within the wreath is a flat metal cut-out depicting the name of the inn which usually occurs again in lettering on a ribbon suspended below the wreath. The leaves are painted green, the ribbons gilded, and the cut-out symbol is done either in naturalistic colors or in black and gold.

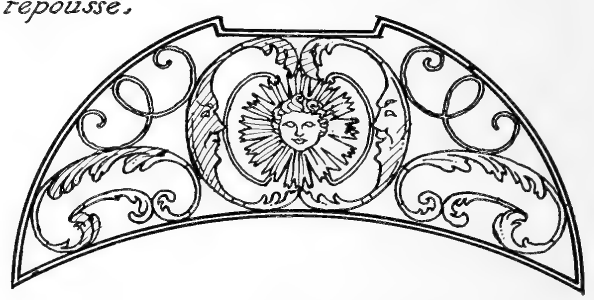
A Square in Strasbourg Showing the Cathedral



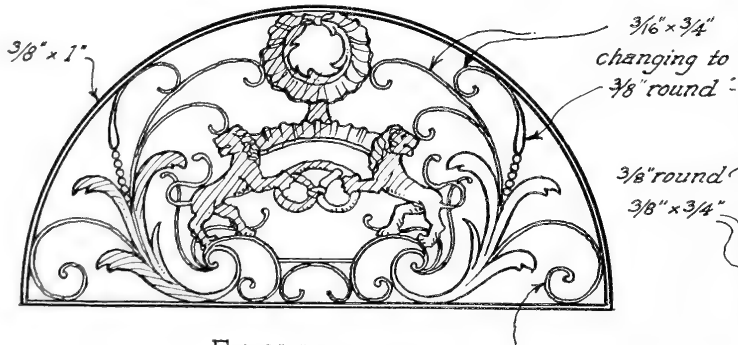
FANLIGHT
Flat Plate 1/16" thick pierced. Swags and Flowers 1/32" repoussé.



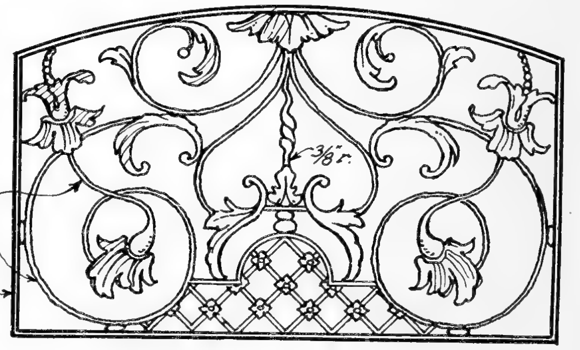
OVERDOOR
3/4"x 5/8" varying to thinner. Leaves & Frill 1/32" repoussé.



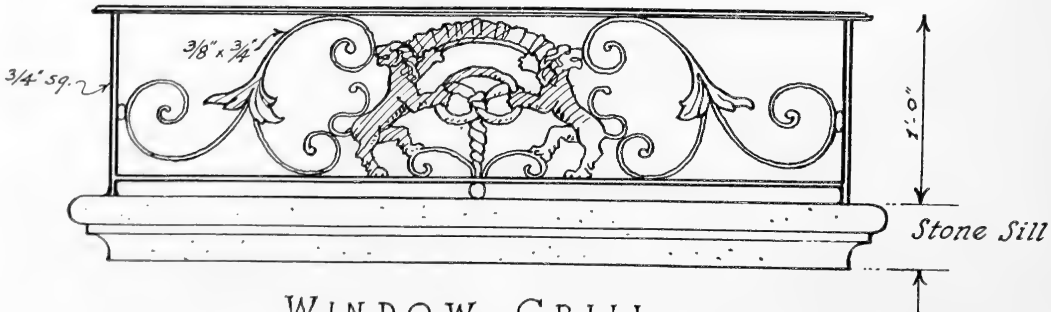
FANLIGHT
3/16"x 5/8" varying to thinner. Moons, leaves, etc. 1/32" repoussé riveted on.



FANLIGHT
From Baker's Shop. In general 3/16"x 3/4". Lions, pretzel, frills, & leaves 1/32" thick repoussé.



OVERDOOR
About 3/8" on face - 3/64" thick - Rosettes repoussé - Leaves 3/64" thick repoussé.



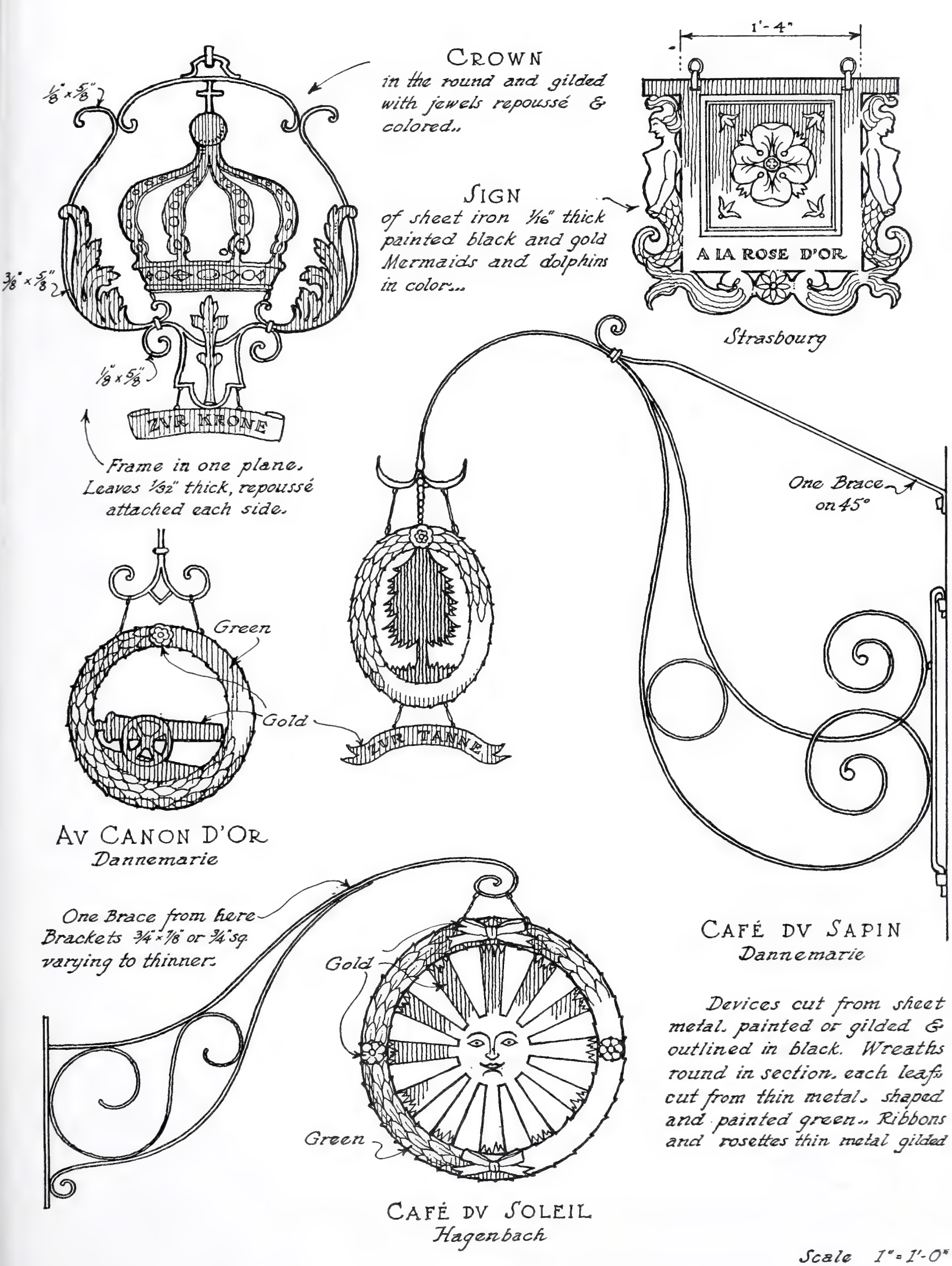
WINDOW GRILL
from Bakers Shop.

Scale 1"=1'-0"

ALSATIAN
DETAILS
1922

·EIGHTEENTH CENTVRY IRONWORK·
·STRASBOVRG·ALSACE·

MEASVRED and
DRAWN by
HOWARD MOÏSE



CROWN in the round and gilded with jewels repoussé & colored.

SIGN of sheet iron 1/16" thick painted black and gold Mermaids and dolphins in color.

Strasbourg

Frame in one plane. Leaves 1/32" thick, repoussé attached each side.

AV CANON D'OR
Dannemarie

CAFÉ DV SAPIN
Dannemarie

One Brace from here Brackets 3/4 × 7/8 or 3/4 sq. varying to thinner.

Devices cut from sheet metal painted or gilded & outlined in black. Wreaths round in section. each leaf cut from thin metal, shaped and painted green. Ribbons and rosettes thin metal gilded

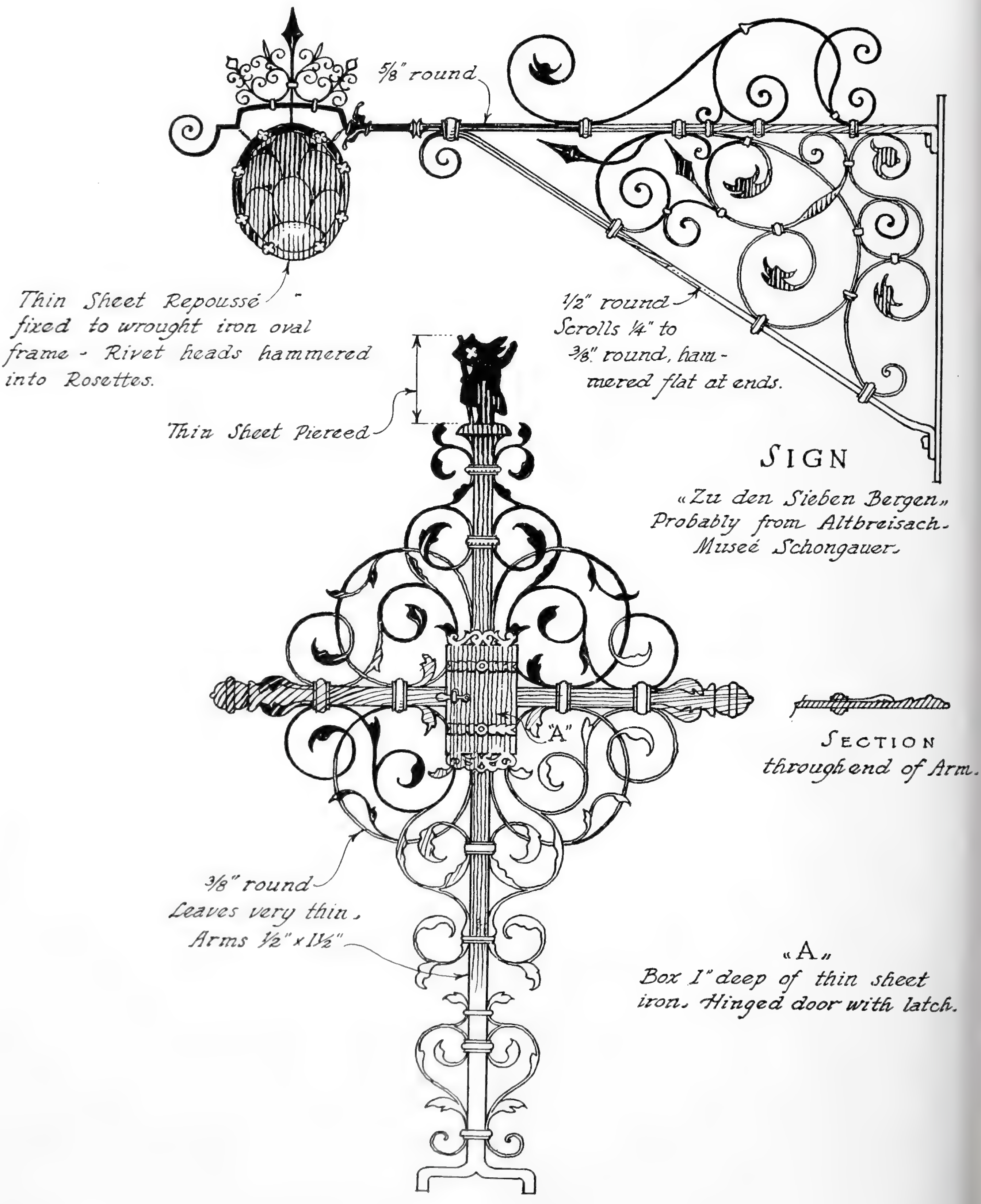
CAFÉ DV SOLEIL
Hagenbach

Scale 1" = 1'-0"

ALSATIAN
DETAILS
1922

· EIGHTEENTH CENTVRY SIGNS ·
· ALSACE ·

MEASVRED and
DRAWN by
HOWARD MOÏSE


5/8" round
Thin Sheet Repoussé fixed to wrought iron oval frame - Rivet heads hammered into Rosettes.
1/2" round
Scrolls 1/4" to 3/8" round, hammered flat at ends.
Thin Sheet Pierced
"A"
3/8" round
Leaves very thin.
Arms 1/2" x 1½"

SIGN

«Zu den Sieben Bergen»
Probably from Altbreisach.
Museé Schongauer.

SECTION
through end of Arm.

«A»
Box 1" deep of thin sheet iron. Hinged door with latch.

-CEMETARY CROSS-
Musée Schongauer

Scale 1" = 1'-0"

ALSATIAN
DETAILS
1922

SEVENTEENTH-CENTVRY-IRONWORK
-COLMAR-ALSACE-

MEASVRED and
DRAWN by
HOWARD MOÏSE

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Electrical Wiring Layouts for Modern Buildings

PART IV

By NELSON C. ROSS, *Associate Member, A.I.E.E.*

IN the preparation of plans and specifications for the electrical equipment of a structure of any kind, the use for which the building is intended must be considered.

Electrical Cooking Apparatus. If cooking with the use of small portable equipment is to be considered, this equipment requiring from 500 to 2,000 watts, a 20-ampere receptacle or heater combination, fitted with pilot lamp and switch, together with a circuit of two No. 10 or 12 wires (depending upon the distance to the panel board) will be ample to take care of the load. If one of the large stationary ranges is to be used, there must be a separate circuit running from the service connection to the range; this should be independent of the lighting feeders, and provision should be made for metering this circuit separately at the meter board. The circuit should terminate at an outlet box or fitting, and conduit should extend from this outlet to the range, when the range is set in position. The larger ranges have a panel board, properly fused, in the body of the range and the circuit should terminate in this panel box, the wires connecting directly to the studs of the main fuses or switches.

The size of copper to use for the operation of the range will depend upon its capacity; the ampere load when every unit is in use should be ascertained, and the copper proportioned to take care of this load. As a rule not less than No. 6 wire should be used on the average household range. The circuit will be of two wires or three wires, depending upon whether a two- or three-wire service supplies the building. The wiring contract will require the circuit to be complete from the service connection to the range outlet, 6 feet being left on the wires to permit the later connection to the range. The contractor setting up the range, as a rule, will make the final connections.

Power Circuits. If the building is large there may be required an electric elevator or a stationary refrigerating plant, as well as the motors for the laundry, referred to elsewhere. If the power service is supplied over separate service lines, the power service should be in all respects separate from the lighting service, the power operating on a two- or three-phase current, while the lighting service operates on a single-phase current. It is seldom, however, that more than one service is used for residence work, both motors and lighting being supplied from the single-phase service.

The small motors used in the kitchen, and portable motors for use elsewhere, may be plugged in the different receptacle outlets and thus operated from the lighting circuits. The stationary motors of from 1- to 5-horse power capacity should have separate circuits in the building. All stationary motor circuits should be metered separately from the lighting circuits, as there is a special rate for motor operation.

On the two-wire system both the motors and lighting will operate at 110 volts. On the three-wire system the lighting will operate at 110 volts and will be connected to balance on both sides of the three-wire system. The motor circuits will, however, operate on 220 volts and will connect across the two outside wires of the three-wire system. At each motor there should be installed an enclosed type safety switch, fused to protect the motor, the conduit and circuit passing through the switch box and terminating at the motor in a fitting of the condulet type. On alternating current circuits a switch alone is required to start motors up to 5-horse power. On direct current circuits each motor requires a starting box or controller in addition to the switch; the starting box is as a rule located at the side of the starting switch.

Where an elevator or refrigerating plant requiring an automatic type of controller is used the electrical contract requires the wires of the circuit to terminate in the switch referred to, and all connections from the switch to the automatic controller and motor are made under the contract for the equipment. Where the equipment just described is used, there should be a drop cord outlet located near the machine, this connected from the lighting circuit.

Panel Boards. The panel boards or cutouts will be of the two-wire or three-wire type, depending upon the service. If the two-wire service is supplied the panel will be equipped with two-bus bars and two-wire branch circuits; these panels are known as the "two-wire main and two-wire branch"; a typical two-wire panel is shown in Fig. 1. This panel is of the plug fuse type, without switches in mains or in branch circuits.

If the three-wire service is supplied the panels will have three-bus bars and two-wire branch circuits. The voltage between the neutral and either outside bus will be 110 volts, while the voltage between the two outside bus bars will be 220 volts. These panels are known as "three-wire main and two-wire branch." Fig. 2 shows a typical panel of this type; this panel is equipped with both switches and fuses in the branch circuits. The panels may be made with fuses only in the branch circuits or with fuses and switches in the branch circuits, and also in the mains and with either knife blade, push button or snap switches or with plug or N. E. Code fuses.

In residence wiring the panels are usually installed in the basement and it is seldom that other than the fused type of panel similar to that shown in Fig. 1 is required. If it is desired to control the branch circuits from the panel, then switches should be added to the branch circuits as in Fig. 3.

If a certain section of the building is controlled from any one panel, and it is desired to cut the entire service to that section out at will, then there should be added a fused main switch on the panel, this connecting directly with the bus bars. If the panels are located in conspicuous places and it is desired to control the branch circuits from the panels, then panels of the safety type are used. (See Fig. 3.) These panels have the fuse plugs in separate compartments and are fitted with push button switches; all exposed copper is under lock and inexperienced persons may operate the switches without danger of being shocked.

Panel boards may be made up with porcelain cutouts installed in steel cabinets, the bus connections being made with the proper sized wire. These "made up" panels, however, cost nearly as much as the standard slate fuse panel, require more room and in the long run are not as satisfactory. Branch circuit fuses on 110-volt work may be of either the N. E. Code or the plug type; the plug fuses are less expensive to replace, but are more unsightly when used in connection with open panel boards. Plug fuses are not used above 30-ampere capacity.

Panel boards should be installed in steel cabinets, either of the flush or surface type; each cabinet should be fitted with hinged door and lock; a gutter space should be partitioned off on all sides of the panel, the circuit wires concealed in this gutter and passing through holes in the partitions for connection to the fuses. Each circuit should be numbered and a schedule posted on the inside of the door, showing the outlets controlled by the circuits for convenience of operation.

The system, when finished, becomes a network of wires, the current feeding in over the "service wires" to the "service switch" and from the "service switch" (through the meters) over the "feeder wires" to the "panel boards," and over the branch circuits from the panel boards to all lighting outlets. Each branch circuit from the panel boards to the outlets is composed of two No. 14 wires, these circuits carrying not more than from 6 to 10 amperes. Each branch circuit is fused with a 6- or 10-ampere fuse.

The sizes of the feeder circuit are determined by

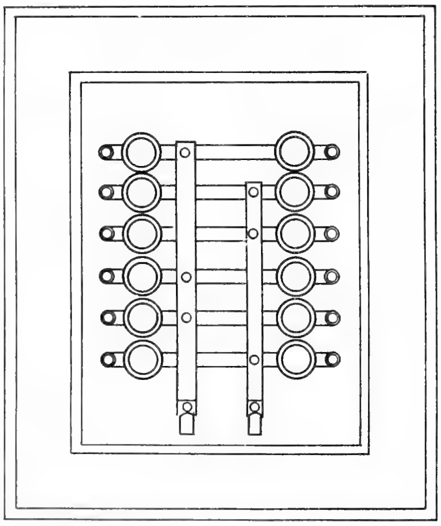


Fig. 1. Two-wire Panel Board

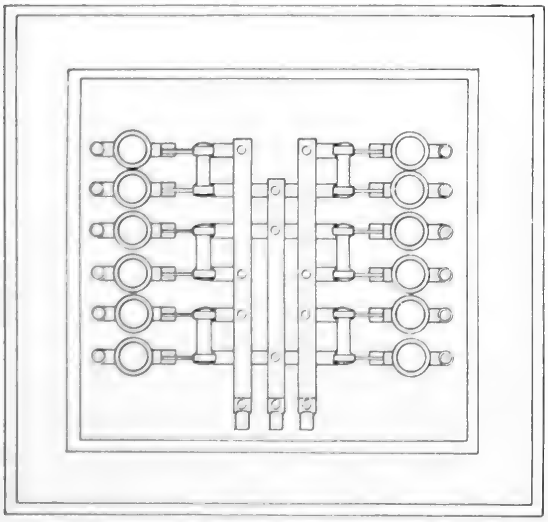


Fig. 2. Three-wire Panel Board

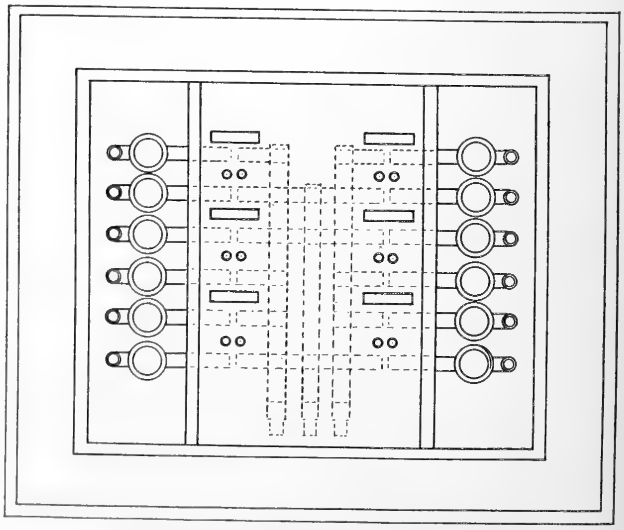


Fig. 3. Safety Type Panel Board

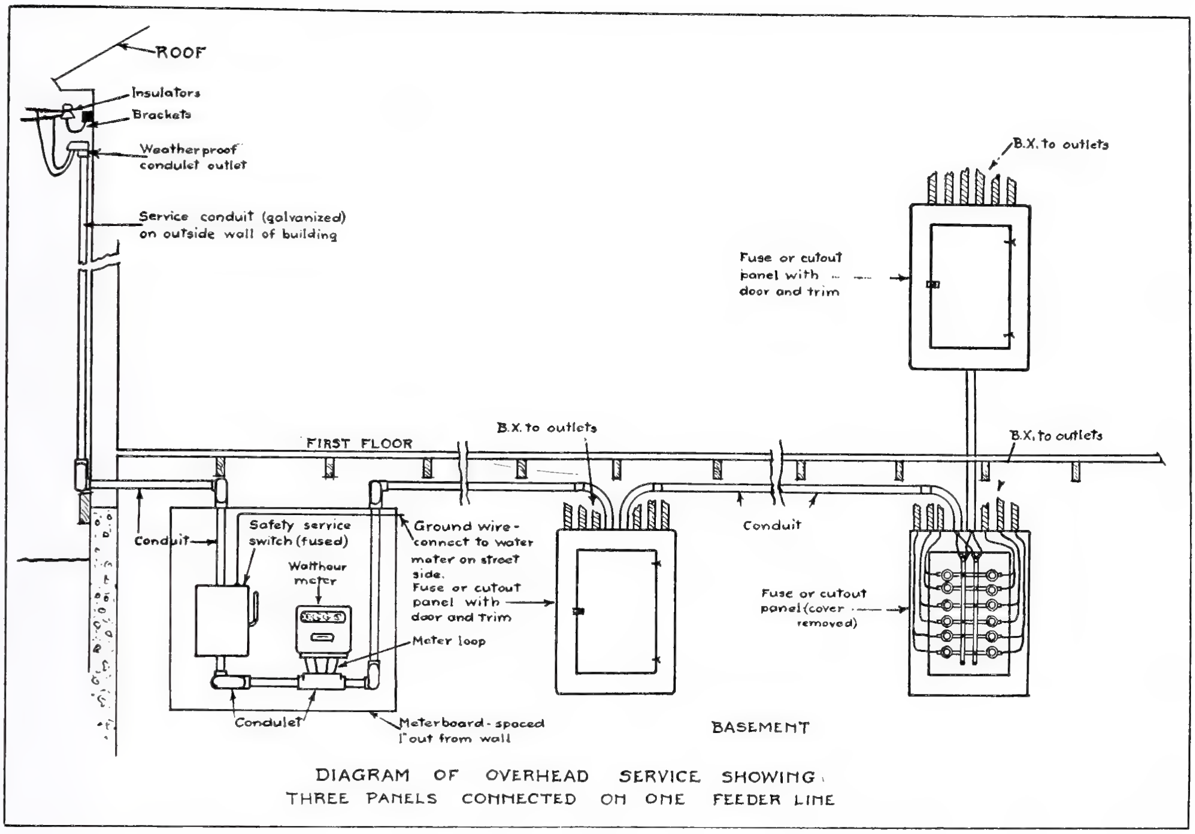

ROOF
Insulators
Brackets
Weatherproof condulet outlet
Service conduit (galvanized) on outside wall of building
B.X. to outlets
Fuse or cutout panel with door and trim
FIRST FLOOR
B.X. to outlets
B.X. to outlets
Conduit
Safety service switch (fused)
Watthour meter
Ground wire - connect to water meter on street side.
Fuse or cutout panel with door and trim
Meter loop
Conduit
Fuse or cutout panel (cover removed)
Condulet
Meterboard - spaced 1" out from wall
BASEMENT

DIAGRAM OF OVERHEAD SERVICE SHOWING THREE PANELS CONNECTED ON ONE FEEDER LINE

Fig. 4

the ampere load required by the total number of panels connected to the feeder (the ampere load depends upon the wattage required by the outlets) and wire of the proper carrying capacity selected. The feeder circuits are protected by fuses at the service switch. The service wires from the "service switch" to the lines of the service company must be of the total capacity of all the feeders in the building.

Service Connections. The service switch and meter board must be located in the basement, at a short distance from the point where the wires enter the building. The service switch must not be located on stairs or in a place where it is likely to be disturbed, but it must be accessible for the replacement of fuses and the reading of the meters. In some instances the exact location of the service switch is determined by the local inspector. If the building is located in a city where underground service is furnished, then the service to the building will be underground from the nearest manhole of the system. If overhead service is general, the service to the building may be overhead from the nearest pole to the building, or underground cable may be used from the nearest pole to the building.

With overhead service the wires pass from the nearest pole to brackets on the building. This work is done without charge by the service company. The wiring contract requires a conduit with weatherproof head on the outside of the building, the wires passing through this conduit and terminating in the service switch. (See Fig. 1 in March issue.) If underground service is desired, a conduit may be run from the nearest pole down and underground to the building, terminating in a junction box on the inside of the basement wall (Fig. 2 in March issue). Conduit must continue from the junction box to the service switch, and rubber covered lead sheathed wires must be run in the conduit from the junction box to the pole.

If desired, "steel tape armored cable" may be run from the junction box to the pole in place of the wires in conduit; this cable is protected by a lead sheath over the insulation, two tapings of steel and two coverings of jute impregnated with waterproof compound; it is merely dropped into a trench and covered, but it should be protected with iron pipe where it passes from the ground and up the pole. The service wires should be protected by a pothead at the point on the pole where they connect with the line wires.

It is the custom for the service company to bring its wires to a point at the edge of the consumer's property, and if the building is near the street and no poles are required set on the property, the company will swing its wires from the pole to the brackets on the building without cost. If the distance from the street is so great that poles are required set on the property, then the cost of the connections from the street to the building must be paid by the consumer; or if underground service is required, the consumer must bear all expense of this service from the pole to the service switch.

The size of the service wires will depend upon the load; no service wires, however, smaller than No. 6 B. & S. gauge should be used. The meter and service board should be of wood, securely battened and fastened to the wall. It should be painted with two coats of asphaltum or other suitable paint as soon as installed. The service switch should be of the safety type, with fused switch installed in steel cabinet and operated from an outside handle. The wires of the service terminate in the fuse studs of the switch. Where not more than 10 or 12 circuits are used on the panel board, and the average length of the circuits does not exceed 60 feet, the panel service switch and meter are generally mounted on the service board. (See Fig. 2 in March issue.) Fittings of the condulet type are used, the meter installed with all wires under iron, and the B.X. wires or conduits are carried directly from the panel board to the outlets.

For small installations there are several "metering service switches" obtainable where the meter and service switch are combined in one box or cabinet. The installation however would be the same as indicated in Fig. 2 except that the meter and service switch would be combined. Where the average length of the branch circuits is more than 80 feet, or where there are a great number of circuits installed, it is advisable to make use of two or more panel boards, each board feeding a certain section of the building. The panels may be located in the basement or on the different floors. They should each be set approximately at the center of the distribution of the circuits they control. Where the building is in several sections, it is generally advisable to provide a panel board for each section of the building.

With the use of a number of panel boards, the meters and service switch are located at the point of entrance and the feeder circuits run in conduits from the service switch to the panels, either singly or connecting them in group as indicated in Fig. 4.

If a large electric range or motors are to be used, requiring separate feeder circuits from the service board, a meter as switch for the control of each circuit would be installed on the service board in addition to that shown in Fig. 3. Where motors are required for elevator and refrigerating service, as well as for use in the laundry, it is avisable to run one feeder circuit from the service board to a central point, terminating the feeder in a steel cabinet containing branch cutouts, and to run separate sub-feeders from the cabinet to the different motors and equipment, each sub-feeder to be fused in the cabinet to protect the circuit.

Bell Circuits. The wiring contract should include all wiring for electric bells. In smaller houses but two bells are required, one ringing from the front and one from the rear door, the bells as a rule being located in the kitchen. The bells should be of different tones. Batteries should be in the basement; three or four dry cells are required. As the bell circuits require from four to eight volts, the wires may be run in second class construction without protection; if so installed however, they should be secured to the timbers with insulated staples and they should not be run near steam piping.

In buildings of first class construction, conduits must be used; if possible, however, conduits or flexible tubing should be used for the bell circuits in any class of construction, so that in the event of trouble the wires may be withdrawn and replaced without disturbing the walls and finish; it is also advisable to use No. 18 rubber-covered wire for all bell circuits, rather than moisture-proof or annunciator wire, formerly used for this work. If the wires are installed without protection, porcelain tubes should be set in the walls at the points where the wires pass from the walls to the bells and push buttons; wires should not be permitted to come in contact with plaster. With the use of conduit, a standard outlet box should be set at each outlet, the cover to be adapted to the type of bell or button used. Flexible tubing is simply brought out of the wall and into the back of the bell or button.

The batteries may be set either on a small shelf or in a wood or steel cabinet; with the batteries in a central location the conduit may be run from the cabinet to the bell, location wires of both circuits to be run in the one conduit, separate conduits then being run from the cabinet to each button, the wires drawn in and all splices made in the cabinet. If batteries are not desired, a bell ringing transformer may be installed; this should be set at a point near the lighting panel, and connections made with the lighting circuit through 3-ampere fuses. All connections from the panel to the primary side of the transformer should be made in conduits and in accordance with the rules governing the installation of the lighting circuits.

Where a more extensive bell system is required, an annunciator is used, this being located in the kitchen or at the servants' station, with push buttons at each door, under table in dining room, in bathrooms, halls and in the bedrooms. At times a second system is required with annunciator in maids' corridor, this connected with separate buttons in the different bedrooms. If signals are to be answered from two points, as from the kitchen section and from the servants' corridor also, two annunciators are used, these being duplicates and connected in multiple, so that any call is registered on both annunciators. The resetting button may be mounted on the frame of the annunciator, or the circuit may be extended and the button mounted in any desired location. The type and capacity of the battery will be the same, regardless of the number of stations.

Some Facts on Warm Air Heating

PART II

By L. A. BRISSETTE

IN laying out a heating plant of any character, whether for warm air heating or steam, the architect should first calculate the amount of heating required for the various rooms. This is represented by square feet in radiation or by register sizes in hot air installations. In the latter system, if the furnace and the heating conductors are proportioned properly for the various rooms, it is possible scientifically to calculate the exact amount of coal to be burned per square foot, as well as the number of B. t. u. required to heat the rooms, but since the architect's plans are usually not intended to confine the contractor or the heating engineer to the strict limitations indicated, but are merely a guide on which a comparative figure may be based, it is not always desirable that these items be figured to the accurate limit.

In the heating specifications a clause should be inserted to the effect that "the sizes of registers, pipes and furnaces are minimum sizes and must not be reduced but may be increased by the contractor if, in his judgment, it may be necessary in order to enable him to guarantee to heat all the rooms to 70° in zero weather." This will be found to protect the owner's interests as effectually as though the architect carried his calculations to the last decimal point from scientific analysis. There are short-cut tables which may be obtained from the various manufacturers of the heating units or from various text books which are of value to architects, and which can always be used in determining the sizes of the various registers, pipes, etc.

Figs. 1 and 2 show an installation in which the heating company which furnished the heat producer were also the engineers on the work, and it may therefore be taken as an example to show the correct proportions of the various parts of the system from the heating engineers' standpoint.

In the March issue the basement plan of this same residence was reproduced. This plan shows a typical arrangement of the heater and pipes with the basic idea of equalized runs. Figs. 3 and 4 show two tables indicating different methods of calculating the area of pipes and the amount of register surface required. One, as will be noted, refers to the air change. The other refers to the exposed wall and glazed surfaces. A careful analysis will show only slight variations in the calculations, whichever method be adopted. It is always advisable for the architect to approximate the sizes of pipes and registers before sending plans out to be figured, and these tables will be found of great assistance in the work.

Another thing which must be considered with proper care by the architect in installing a hot air heating system in a house is the position of the registers. In a previous article it was noted that the registers, from the standpoint of housekeeping, should be in the walls, and in this position they are no less efficient from the heating engineer's standpoint than they are in the floor. Some people prefer floor registers; some people prefer wall registers, so that the matter of choice enters largely into the determination of this particular question; but one thing which cannot be left to choice is their position in relation to exposed walls.

In steam or hot water heating the radiators are placed near the windows or under windows or ex-

Fig. 1

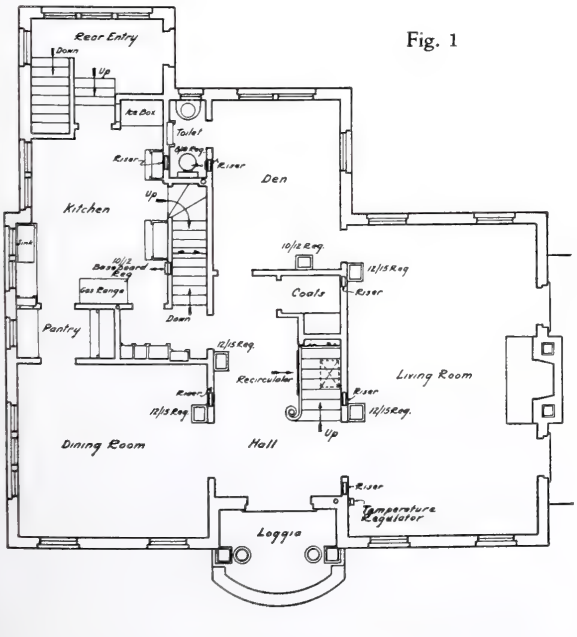
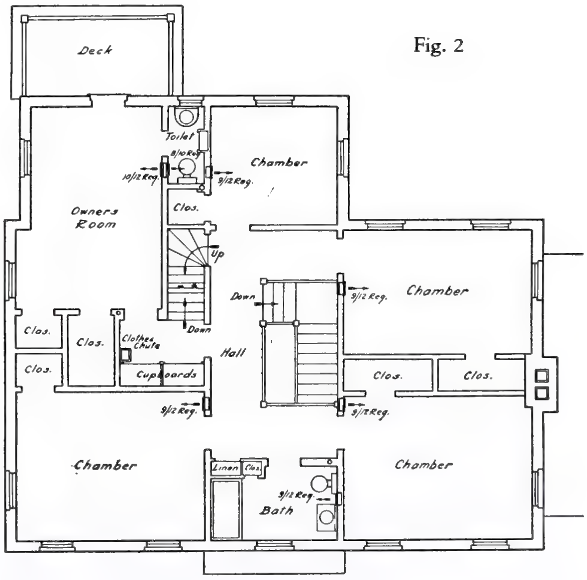


Fig. 2



posed walls, while in a hot air heating arrangement the registers should be placed, not under the windows but on the *opposite* side of the room, the theory being that as the warm air rises to the ceiling, it travels across all the exposed wall surface where it is chilled and thence drops to the floor on account of its increased weight. Thus a positive circulation is established which helps to draw the warm air into the room and more effectually heat all parts of the room. The warm air register located directly under a window, for example, would be in a very disadvantageous position because of the current of cold air coming down the wall and down the surface of the glass, having a tendency to form a cold blanket directly over the register surface. Under these conditions sufficient pressure must be applied to the warm air column to enable it to force its way through this blanket.

The installation of the pipes, in connection with the hot air heating system, is deserving of considerable thought and attention. Where these pipes are concealed in partitions it is desirable to see that they are so arranged and constructed as to minimize the heat losses and also to serve as a protection against the possibility of the spread of fire through these pipes. Fire cannot originate in or be caused by the hot air furnace itself, but with the pipe openings carried up through the partitions, there is a natural chimney formed which might easily carry flames from one part of the building to another provided the pipes were not made sufficiently tight at the joints.

In addition to the tight and rigid construction of the pipes it is quite essential that either a layer of asbestos paper or some other insulating medium be placed over the outside of the pipes or that an additional pipe be run enclosing the heater pipe. This double pipe construction forms a dead air space outside of the heat conductor which, in itself, is good insulation. Where these pipes pass through floors, the edges of the floors and the timbers should be protected by a metal or asbestos covering, and wherever the pipes pass through a partition or through studding, a similar metal or asbestos sleeve should be provided as additional fire protection.

Many times the pipes in the basement are extended from the heater to meet the rising lines without having the proper supports. In the case of long runs, supports should be provided at intervals of not over 5 feet so that the pipes may be rigidly secured to the timbers overhead. This will prevent the sagging of the pipes and consequent opening of joints with attendant heat loss.

No heating system is complete, where hot air is the medium employed, without establishing a complete recirculation system. In Fig. 1 the recirculation register shown at the side of the stairs is installed in order to facilitate the circulation of air and also to prevent cold drafts down the stairs. In very mild weather, all of the air entering the furnace may be taken from out of doors. In colder weather, the outdoor opening may be tightly closed and all of the air taken through the recirculation register. This is a more convenient and more economical method of heating in cold weather than taking the entire air supply from out of doors, and inasmuch as the opening and closing of outer doors and the leakage around windows and doors always provide a certain amount of fresh air in the house, there need be no concern about using the air over and over again.

In more recent years the general public has become much more intelligent as to the advantages of the hot air type of heating, and it is only fair to assume that before long the unjust criticisms which have been applied to this system of heating will be entirely done away with and then we will no longer hear the complaints about dust, gas and cold rooms when a hot air system is mentioned, because these are not due to the hot air system itself but to shortcomings in the other portions of the construction work, which the architect must see are properly carried out.

Room	Size	Cubic Contents	Changes Per Hour	Air Velocity	Square Inches	10% Fric. Res.	Total Sq. In.	Diameter Pipe Used	Area Sq. In.
First Floor									
Living Room	15 x25 x8½	3188	6	250	184	18	202	12" 10"	191
Dining Room	14 x15 x8½	1785	5	250	86	9	95	12"	113
Den	10 x14 x8½	1190	5	250	58	6	64	10"	78
Kitchen	12 x14 x8½	1428	5	250	68.5	6.8	75	10"	78
Halls, 1st&2nd	10 x18 x17	3060	4	250	115	12	127	12"	113
Second Floor									
N.E. Chamber	12 x15 x8½	1530	4	275	53	5	58	9"	63
N.W. "	12 x15 x8½	1530	4	275	53	5	58	9"	63
S.W. "	10 x15 x8½	1275	4	275	45	5	50	9"	63
South "	10 x10 x 8½	850	4	275	30	3	33	8	50
S.E. "	12 x16 x8½	1632	4	275	57.6	5.8	63	10"	78
Toilet	3 x 6 x8½	153	4	275	5.3	.5	6	10"	75
Bath	6 x10 x8½	510	5	275	22	2	24	8"	80

2–18 x 26 Cold Air Ducts = 936 Sq. In. Total Sq. In. Pipe Area 940

Fig. 3

Room	Size	Cubic Contents	Sq. Ft. Exposed Wall	Sq. Ft. Glass Surface	Square Inches	Add for Exposure	Total Sq. In.	Diameter Pipe Used	Area Sq. In.
First Floor		1%	10%	100%					
Living Room	15 x25x8½	3188	366	102	171	N. & W. 10%	188	12" 10"	191
Dining Room	14 x15x8½	1785	187	60	97	North 10%	107	12"	113
Den	10 x14 x8½	1190	117	45	69	West 10%	76	10"	78
Kitchen	12 x14x8½	1428	181	40	72	Cold Entry 10%	79	10"	78
Halls, 1st & 2nd	10 x18 x17	3060	37	48	83	North 10%	91	12"	113
Second Floor		Deduct 10%							
N.E. Chamber	12 x15 x8½	1530	200	30	65	North 0	65	9"	63
N.W. "	12 x15 x8½	1530	200	30	65	N. & W. 0	65	9"	63
S.W. "	10 x15 x8½	1275	183	30	61	West 0	61	9"	63
South "	10 x10 x8½	850	150	20	44	South −10%	40	8"	50
S.E. "	12 x16 x8½	1632	200	38	74	S. & E. −10%	67	10"	78
Toilet	3 x 6 x 8½	153	20	6	10	South −10%	9	10"	
Bath	6 x10 x 8½	510	75	10	23	North 0	23	8"	50

Total Sq. In. Pipe Area 940

Fig. 4

Tenement House Planning

SOME NOTES ON CONDITIONS IN NEW YORK AS INDICATED BY THE RECENT COMPETITION FOR MODEL TENEMENTS

TENEMENT houses are largely built by the speculative builder, and their planning is stereotyped because the builder has no incentive to plan any better than legal requirements demand. Conditions surrounding the financing and sale of tenements are also such that good architectural service is not properly appraised; in fact it may act as a penalty. As a consequence, architects of good training who enter this field do so at a sacrifice.

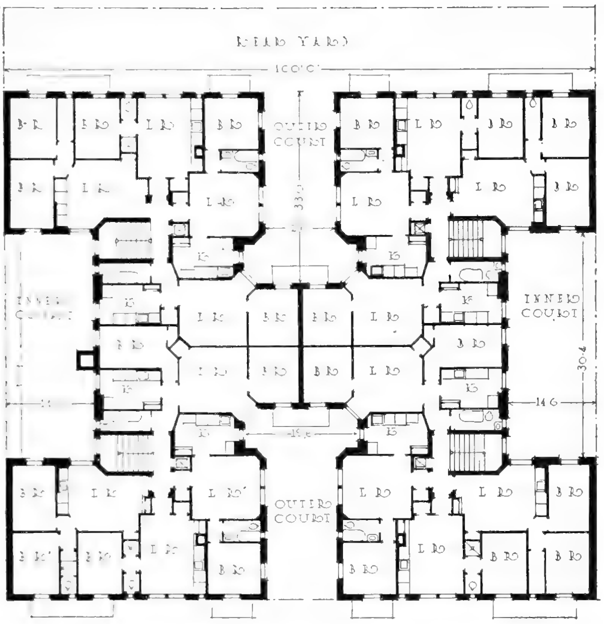
In speculative building of any type, the attitude of loaning institutions is of paramount importance. The builder is chiefly concerned with limiting the amount of his equity, and if an architect can help him do this he is eager to employ the architect. On the other hand, if the speculative builder can take his stock plans and get equal recognition by loaning institutions he sees no particular reason why he should employ an architect. This loss of employment to the architect in the general scheme of things is of little moment, but the loss to the public in being deprived of the buildings which conditions should make possible for the architect to create is of the greatest importance. With the realization of this there has recently been held in New York a competition for a tenement house that has particular interest because it serves to emphasize many of the basic fundamentals of the whole subject of housing for both the poor and those of moderate incomes. The Trustees of the Phelps Stokes Fund defrayed the expenses of the competition and have offered to supply, as an investment, the funds necessary to construct the winning design.

The competition was held with the hope of stimulating the development of better and more economical types of tenement houses and of securing preferential consideration and higher building loans, based primarily on the superiority and economy of design and construction rather than on actual cost. Specific objects sought were plans combining convenience of arrangement with privacy, good light and ventilation, cheerful outlook and as great a concentration of light and air spaces as possible. Preference was to be given, when other things were equal, to such plans as insured the development of these qualities to a still higher degree when the units were combined in block form.

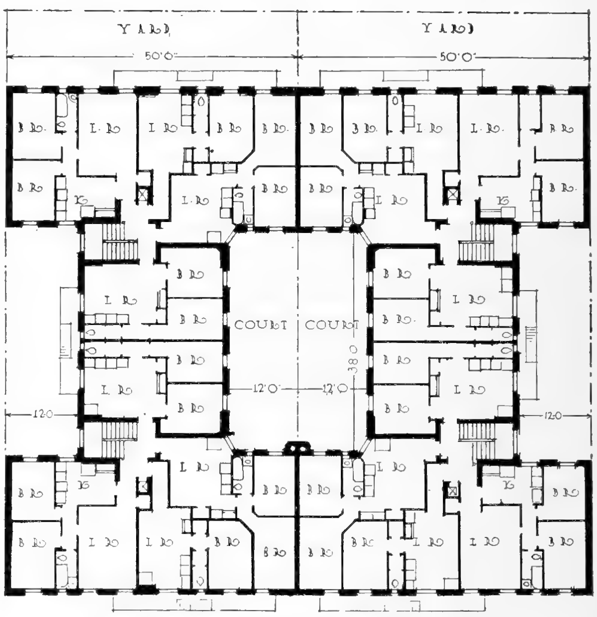
In addition to these general qualities, several definite requirements were made a part of the program. Briefly, these were that a clear rentable area of not less than 56 per cent of the area of the lot should be provided and that 24 rooms should be arranged in the 50-foot unit and 48 in the 100-foot unit, exclusive of baths, that the apartments should consist of suites of 2, 3 and 4 rooms in the ratio of approximately 30 per cent each of 2- and 4-room apartments and 40 per cent of 3-room apartments. Each apartment was to have a bathroom. If the designer elected to incorporate sink, wash tubs, gas range and refrigerator in the living room and group them in such a way as to make possible shutting them off from the room by a curtain or light doors, and if the area of the living room with this strip shut off equaled at least the minimum area required by the tenement house law, 46 rooms were considered the equivalent of 48. This requirement of 48 rooms per floor placed the designing of a model plan on the same basis as actually holds in practice today, and permitted the competitors no opportunity for the use of their inventive genius except in the cutting up into rooms of the space that actually had to be built upon to produce this number of rooms of fixed sizes and which practically demands that 70 per cent of the lot be covered by the building.

The plans that were awarded the prizes are probably as good a group of three plans as could be devised to meet these specific conditions. It is an interesting fact that the plan awarded first prize differs only in slight degree from that awarded first prize in a similar competition held 20 years ago and on the results of which the present tenement house law was formed. The devices that have been adopted in these 20 years have all tended toward the squeezing of more people into smaller spaces and it is a natural question to ask if this is the basis on which we can really improve housing conditions. The problem has always been, and is now, how can we secure the maximum net return from a building that can be fitted to a given plot of land. On high valued land this has always seemed to mean congested living quarters. This condition was accepted in this competition and no opportunity was allowed for disproving it.

A few demonstrations have been made within recent years on land of moderate cost ($20,000 for a 100 x 100-foot plot, for example) that a building covering but 60 per cent of the lot will return an equal or better rate of interest than one covering 70 per cent, assuming the same unit rate of rent per room. Andrew J. Thomas, architect, of New York, has perhaps given more study to tenement house planning from this viewpoint than any other architect and he claims in block developments to be able to place a building containing 42 rooms on a plot 100 x 100 feet and produce the same percentage return on the investment as a building containing 48 rooms, putting the area thus saved into courts which will provide better light and ventilation. Mr. Thomas in fact goes still further with this theory: he claims that a building containing 36 rooms and covering a total area of 5500 square feet



First Prize Plan, Sibley & Fetherston, Architects



Second Prize Plan, Frank J. Shefcik, Architect

can be placed on a 100 x 100-foot plot of any value, which would be proportionate to 46 rooms per floor and give the same percentage return.

We illustrate one of Mr. Thomas' plans and give an analysis worked out by Frederick L. Ackerman of its area, cost and income compared with the same items of the first prize plan. The Thomas plan follows the general scheme of one he submitted in the preliminary competition except that it has 42 rooms to a floor instead of 46 as required in the competition. This plan in a block development would provide side courts, making a 12-foot opening between the buildings. It is here used in comparison with the prize design, since when its two isolated units are reversed in position we have a form which compares with that of the prize design but with this important difference—the courts extend through from front to rear. The area of the Thomas plan is 5988 square feet per floor of 42 rooms. Comparing it with the prize plan and assuming a cost of $40,000 for the land, 35 cents per cubic foot for cost of construction and the average rental per room $8 per month, the building to be considered a 6-story walk-up, 70 feet high, we have:

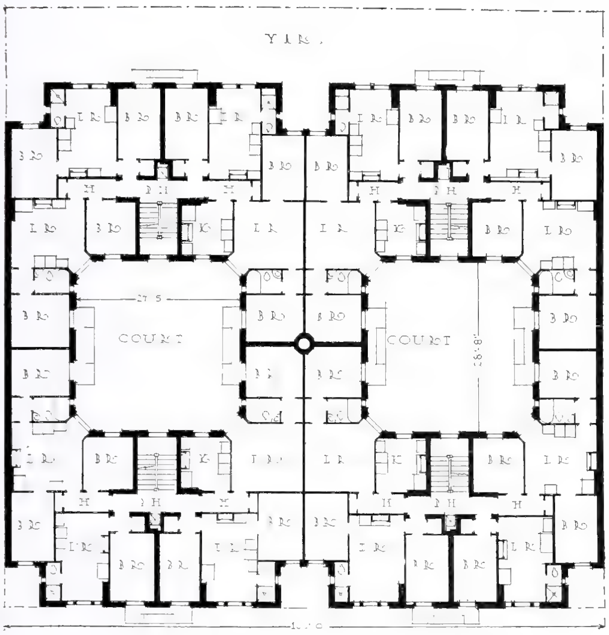
Prize plan, land and building	$207,359
Thomas "	186,706
Difference	$20,653

The Thomas plan contains four less rooms than the prize plan which would reduce the rental income by $2,304 per year. With this reduction the figures are:

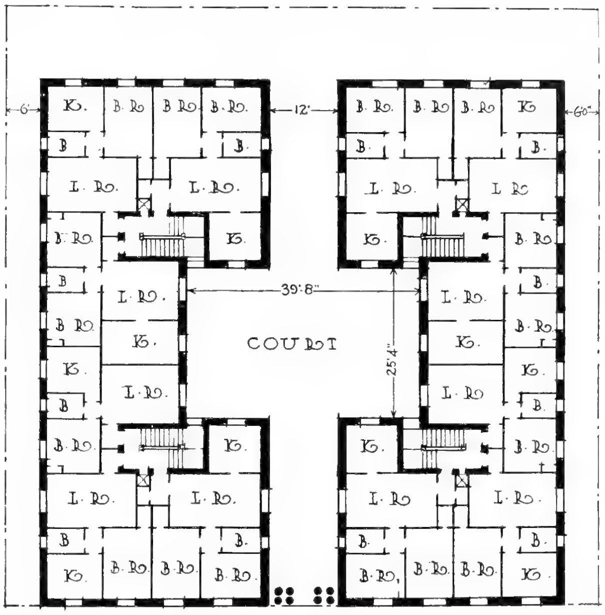
		Gross income	Per cent
Prize plan, land and building	$207,359	$26,496	12.7
Thomas "	186,706	24,192	12.9

In addition to the savings which these figures seem to demonstrate clearly, the simple shape of the enclosing walls and the less complicated partitioning of space within the building should provide a further advantage in cost of construction to the Thomas plan which would be reflected in the rate of income. The disposition of the space not occupied by building constitutes an important part of the plan problem. In a block development it is quite generally admitted that the arrangement of the Thomas plan which provides for through ventilation is more desirable than that of the first prize plan where at no point would there be a through sweep of air from front to rear.

In considering the two plans for a single inside 100-foot lot, criticism has been directed to the narrow side courts of the Thomas plan which are, however, in full compliance with the tenement house law. Concentration of court space is held to be desirable and in fact was mentioned as a specific object in the program for the preliminary competition. It would seem that the light and air derived from the central court of the Thomas plan and serving more than half the building are greater in volume than that from a similar gross area divided into four courts as in the case of the first prize plan. While 6-foot side courts would provide a free passage for air, they would not adequately light the rooms facing on them, but a condemnation of these courts cannot be made with the consideration of this one point. If this building were to be so located that a solid wall existed on the party line, these side courts would be inadequate, but building in New York is governed by the zoning law and a tenement cannot be built adjoining a factory, warehouse or other building which would be likely to be built up solid to the party line. Another tenement would most likely be the adjoining building, and in order to take light from that side it would have to be set back 6 feet, giving a 12-foot court between the buildings, or if it were so planned that an interior court were arranged



Third Prize Plan, John Tompkins, Architect



Plan Based on One Submitted by Andrew J. Thomas, Architect

with an opening on the lot line, this court would have to be 12 feet wide, giving between the buildings a court with a total width of 18 feet and openings to it from the front and rear 6 feet wide.

Assuming the most unfavorable conditions under which the side courts would function, it may be noted that the plan is arranged to have the less important rooms take their light and air from the side courts. The important rooms are grouped about the large central court from which they secure an abundance of light and air which permeate the whole apartment, and by having positive circulation through all courts and a concentration of space in the center, a real cross ventilation through all apartments can be counted upon.

In spite of the evident physical advantages of this open type of plan, a paradox is uncovered when we consider it from the viewpoint of financing. The average loaning institution today appraises new property on a basis of land valuation plus the value of the new building according to its character and the number of cubic feet contained — in other words, the skill of the architect in creating a plan providing greater rental efficiency in the building is not given sufficient consideration. An examination of these two types of plan shows several logical reasons why, other things being equal, a building covering the smaller portion of the given area and costing less money to build should be considered better collateral by a loaning institution. It is true that this is principally a consideration of plan, but when an analysis of the plan shows more desirable rooms from the viewpoint of light, ventilation and size, it is evident that during periods of rental competition between landlords,—in other words when there is no housing shortage, — the more desirable property will remain fully rented and will constitute a better real estate investment.

While there are a few loaning institutions which make a serious analysis of the plans of a building, there are far too many such institutions which do not give proper recognition to efficiency in plan and consequently undervalue the right kind of architectural service. The power to correct this condition lies largely in the hands of the architectural profession. The architect must learn to work more closely with loaning institutions.

Perhaps the recognition of more effective planning of buildings by our loaning institutions is slow because the establishment of a precedent of this nature entails a retroactive effect on collateral values of existing buildings. In other words, the recognition of efficient planning would tend to decrease the equity necessary for the construction of new apartment houses and housing of other types and would place in the market a class of property which offers more inducement to the investor in that he can obtain the same income through the investment of a smaller amount of money. Naturally, the establishment of values of this nature would have a tendency to force down the valuation of existing buildings in the same neighborhood to a relative ratio as between income and selling price. The only answer to this phase of the problem is that the shrinkage in value thus effected would probably not be of sufficient volume actually to endanger any investments of loaning institutions, nor would anyone suffer except those who have attempted to profiteer.

In considering the building up of the congested residential sections of American cities, a decision must be made as to whether the purpose in planning is to house as many families as possible on every city lot or to provide buildings in which better living conditions are really established and which offer better realty values from the investment viewpoint. Somewhere a halt must be called in the constant effort to concentrate domestic life within small spaces.

EDITORIAL COMMENT

ARCHITECTS AND TRADES UNIONS

IF proof is wanted of the damaging effect of current trades union practices upon the activity of the building industry, the example of San Francisco may be cited. Fortunately the present picture is favorable and one from which we can take encouragement because it illustrates what happens when the misdirected activities of unionism cease.

For 25 years San Francisco has been the citadel of trades unionism; every important industry has operated under the closed shop principle and the unions' power extended itself even beyond industrial affairs and into city and state politics. The most aggressive of these unions were in the building trades. Following the most intolerable and chaotic conditions in 1920, an arbitration board rendered a decision in March, 1921, involving a 7½ per cent wage reduction. In spite of previous agreement to abide by the award, the unions stopped all work. The American plan of employment was adopted in June and an organization called the Industrial Association of San Francisco became sponsor for the plan and arranged for the employment of men and the establishment of a permanent wage board to insure to all concerned a square deal.

To perfect a system of employment built upon the wreck of the former system has required time. The building public is now satisfied that this has been done and that the oppressive and uneconomic restrictions which added unnecessary cost to building have been removed. The figures for the construction work begun in San Francisco in January of this year show the amazing sum of $5,528,978, an increase of 170 per cent over the monthly average for the last two years and an increase of 222 per cent above the monthly construction at the beginning of the American plan of employment. A portion of this building program is undoubtedly the accumulation of work held up over several past months and will not be duplicated in later months. It proves, however, that there is a limit to public endurance and that the trades unions are their own worst enemies when they force acceptance of rules and conditions designed to benefit themselves solely.

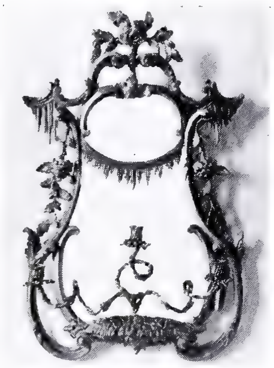
The difficulties between employers and employes in the building trades are gradually coming to be looked upon as matters that concern the public, yet there is as yet no medium through which the public may be represented in the settlement. Contractors certainly have no particular interest in opposing the demands of labor, except as their opportunity for doing business is interfered with; as long as their costs can be passed along to the owner, the contractors have no need to worry—in fact their course is easier to pander to the unions. It is not until the limit of the public patience is reached that a break comes, and then we realize the need of some check.

There is a steadily growing feeling that some movement should be instituted by architects that will provide an opportunity for the expression of impartial views and for representation of the owner, or in other words, the building public, and there seem to be many logical reasons why this should be done. In the first place, the architect is the agent of the owner and he is paid to protect his interests. The architect must protect him against unscrupulous contracting methods involving substitution of materials and careless construction. This means accurate specifications and thorough supervision. Just as important for the architect to consider are the conditions under which the contractor works; if he is hampered by destructive union rules that place a premium on inefficiency and contribute to higher costs by the rejection of any materials the union may designate, it is the duty of the architect to use any legitimate means to stop these abuses. A single architect or scattered groups cannot of course hope to combat evils so firmly intrenched as those that have been fostered by the unions over a period of years. Even so, no harm can come from the attempt and there are many possibilities of good in bringing architects' influence to bear on local conditions, because all elements will get a better idea of the reasons behind the various claims. The union man is too close to his own problem; he does not see it in broad perspective in conjunction with general economics. It is understandable that he should see a pecuniary advantage to himself in restricting output and placing territorial restrictions on semi-finished products. They are comparable to the adoption of a high tariff at the demands of manufacturers. This is, however, no defense of union principles and it is not our intention to discuss here the necessity or merits of either case.

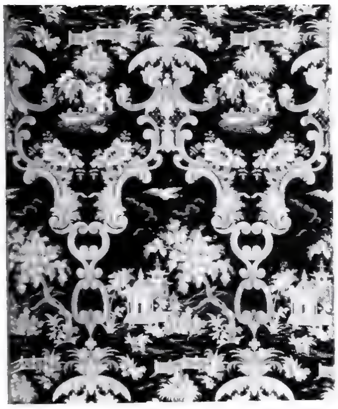
Unions are unquestionably necessary and they will exist in one form or another; the important thing to prevent is an abuse of their power, exercised through scheming and unscrupulous leaders and business agents who have no higher object than maintaining their own advantageous positions. These execrable conditions are gradually eliminated by the action of economic forces, but they are in the same measure created again by different economic conditions, and much hatred and suffering are engendered in the process.

Certainly there must be a more rational way of meeting these difficulties, and architects should give serious thought to the manner in which they can contribute to the general welfare.

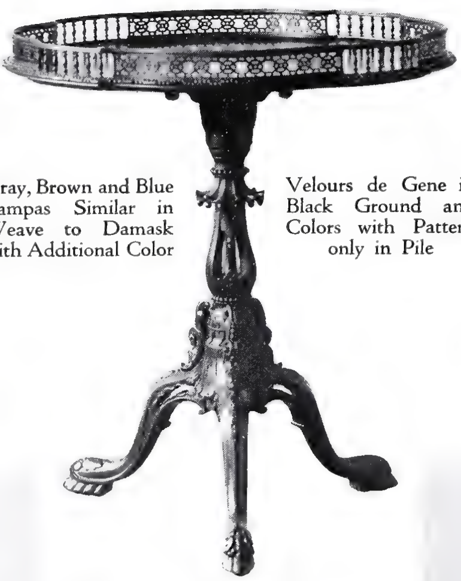
DECORATION
and
FURNITURE



A DEPARTMENT
DEVOTED TO THE VARIED
PROFESSIONAL & DESIGN INTERESTS
WITH SPECIAL REFERENCE TO
AVAILABLE MATERIALS

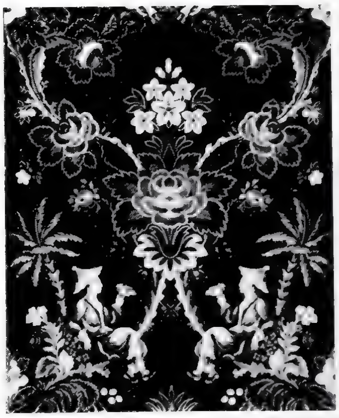


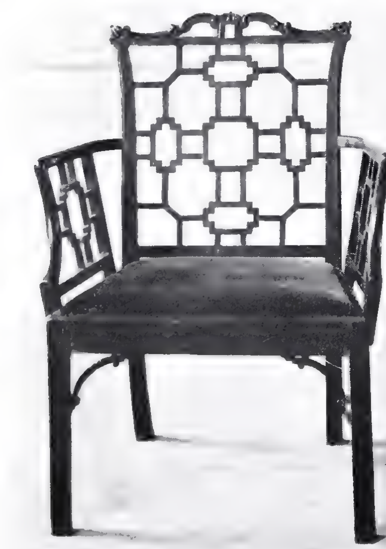
Gray, Brown and Blue Lampas Similar in Weave to Damask with Additional Color



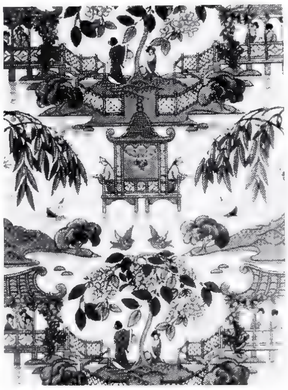
Gallery Table with Fret Rail, Pagoda Pedestal and Dragon Foot

Velours de Gene in Black Ground and Colors with Pattern only in Pile

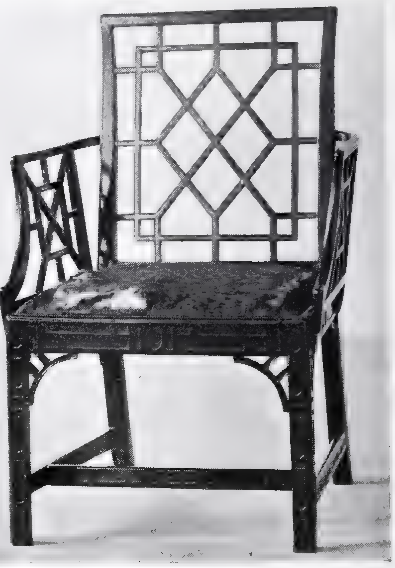




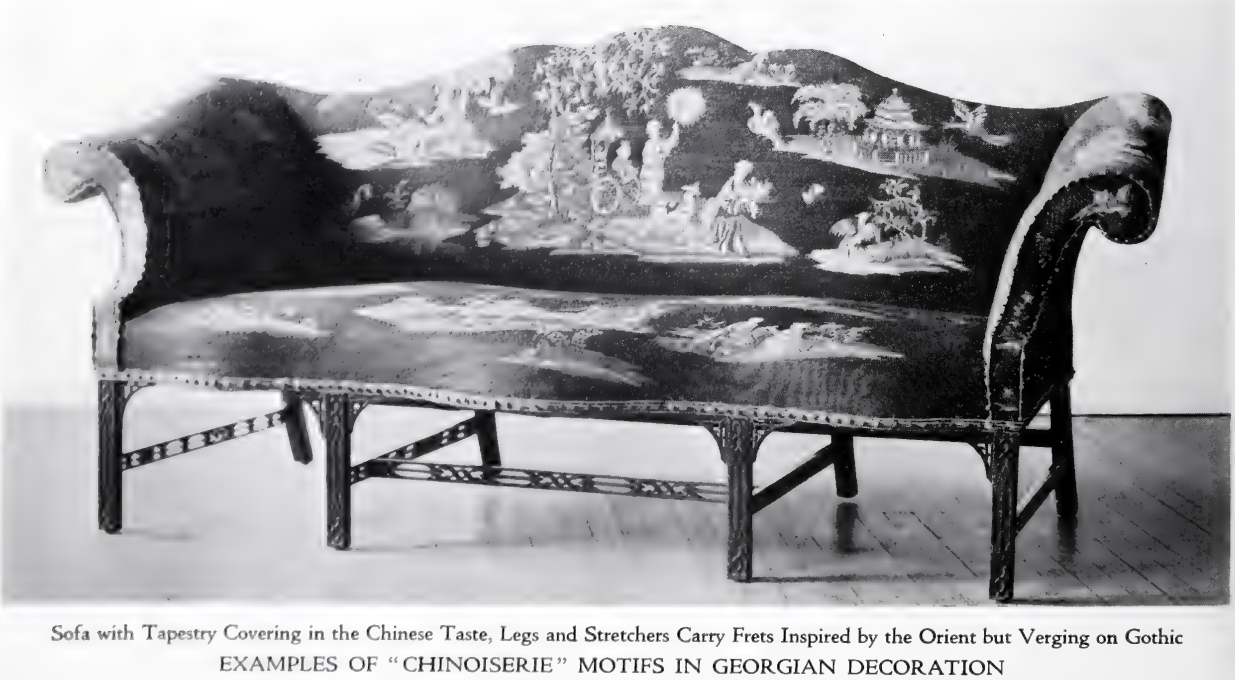
Arm Chair with Geometric Diaper in Back and Cresting in Georgian Spirit



Modern Wall Paper Based on Traditions of 1750



Antique Chair with Sinkage of Frets and Typical Leg Brackets at Seat Rail



Sofa with Tapestry Covering in the Chinese Taste, Legs and Stretchers Carry Frets Inspired by the Orient but Verging on Gothic

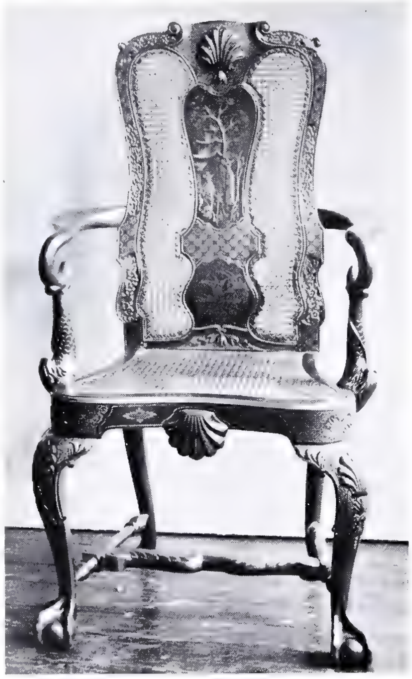
EXAMPLES OF "CHINOISERIE" MOTIFS IN GEORGIAN DECORATION

Furniture by Courtesy of W. & J. Sloane

Chinoiserie in English Decoration

By WALTER F. WHEELER

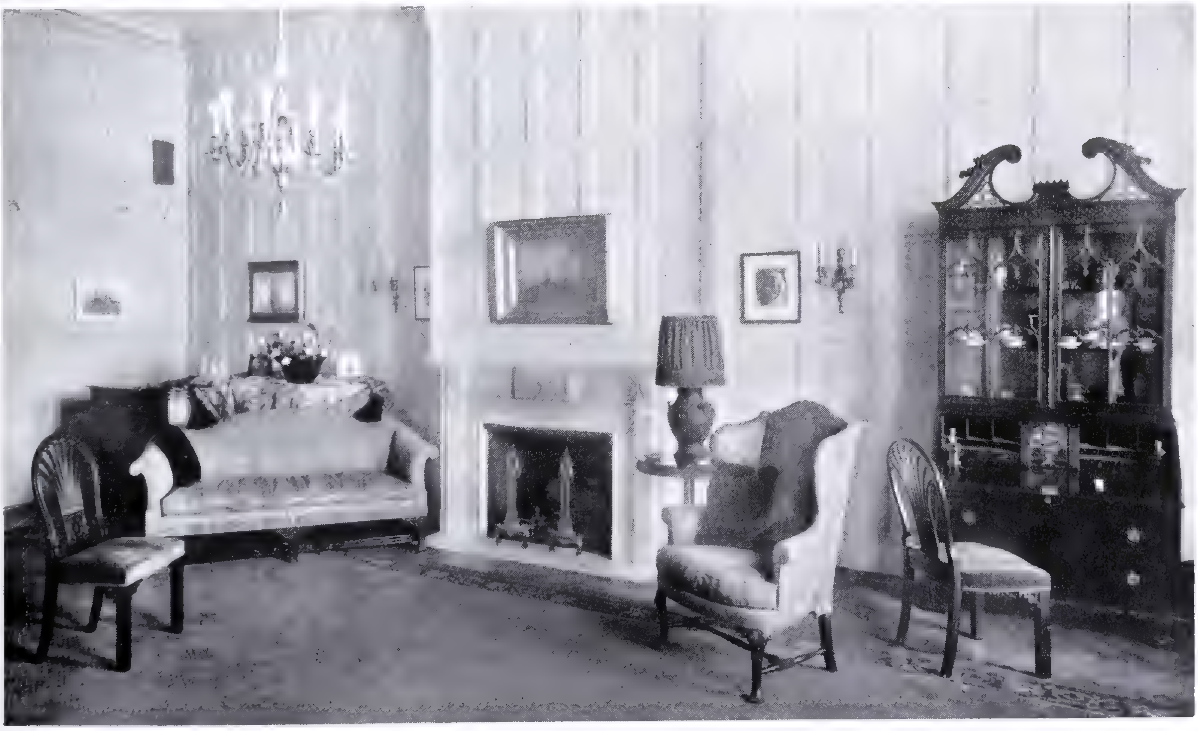
THE rather formal dignity of the eighteenth century English styles is sometimes in need of a note of lightness and gaiety to afford contrast to paneled walls, classic detail and more or less architectural furniture, and this need is supplied by that use of oriental motifs which the Georgian architects summed up in the general term "Chinoiserie." This admirable use of airy brightness in decoration came into England originally, like so much of what made interesting the houses of the eighteenth century, by the way of Holland, and the term designated the use of Far Eastern motifs not only upon fabrics and wall coverings of different kinds but also as ornament for furniture, and as painted decoration galore upon furniture, glass and other materials, decoration used in every conceivable way—scenes of Chinese life showing bridges and boats, or else of Chinamen, fantastically dressed and ascending impossible staircases of frailest pagodas.



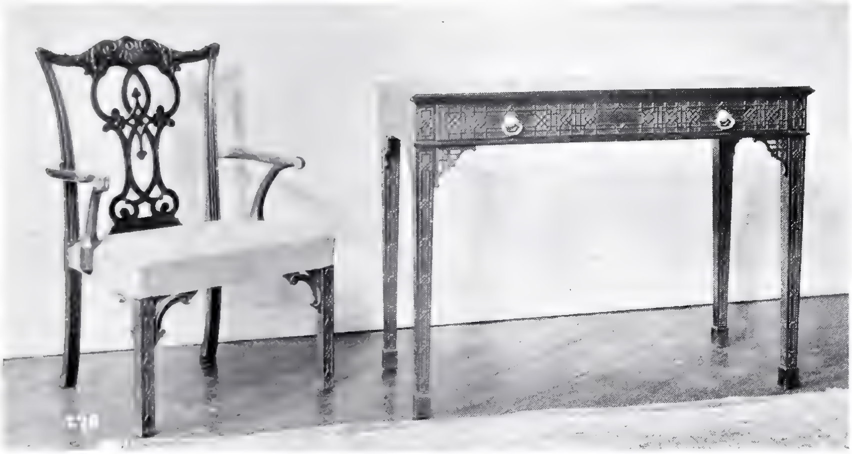
Lacquer Decoration on Chair of Early Georgian Tendencies

The Dutch East India Company had introduced lacquer and "china" into the marts of Europe and a fund of decorative motifs were immediately suggested to English designers for their merchandise. The Chinese have ever been ready with facile brush to suit their exports to a people who would not readily understand the depths of their symbolism, and after the cabinet makers' adaptation of the wispy pagoda of tea cups to the backs of chairs, slight resemblance is borne to the structures of Cathay. The feeling of the orient, however, is sustained, and if it were not for the simultaneous influence of the French rocaille and the mingling of these styles, many flighty conceptions of this time would be spared for the simplicity of line.

Sir William Chambers, then architect to George III, was chiefly instrumental in correcting the excesses into which the style was being carried



Drawing Room in New York House Where the Forms of the Chinese Taste Are Distinguishable in Side Chairs, Sofa and Secretary of the Late Georgian Period
Harry Allan Jacobs, Architect

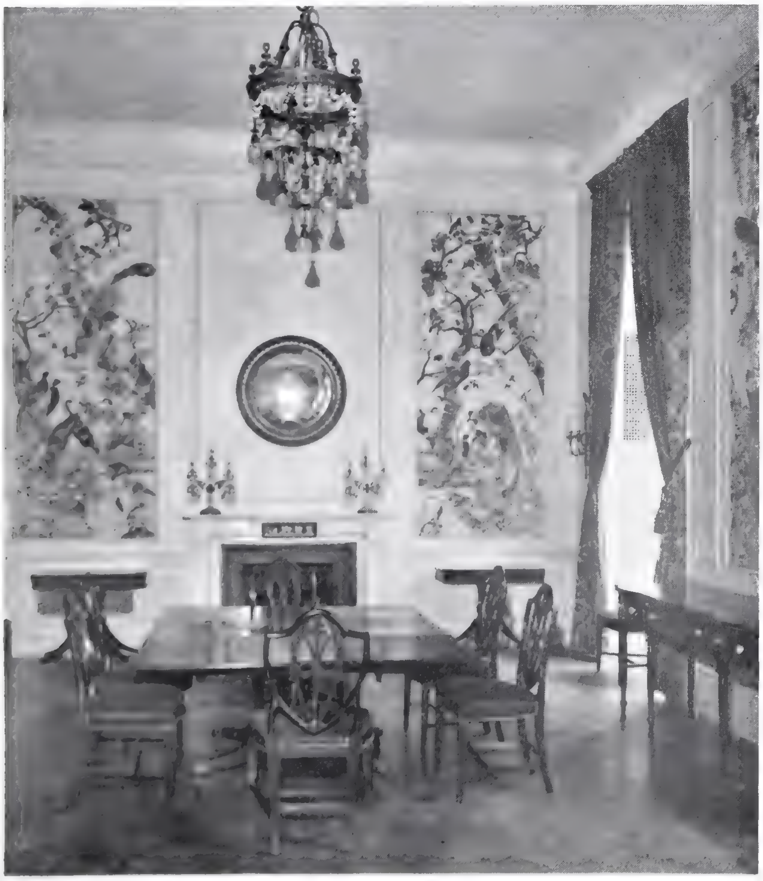


Highly Ornamental though Formal Character of Chinese Chippendale Pieces

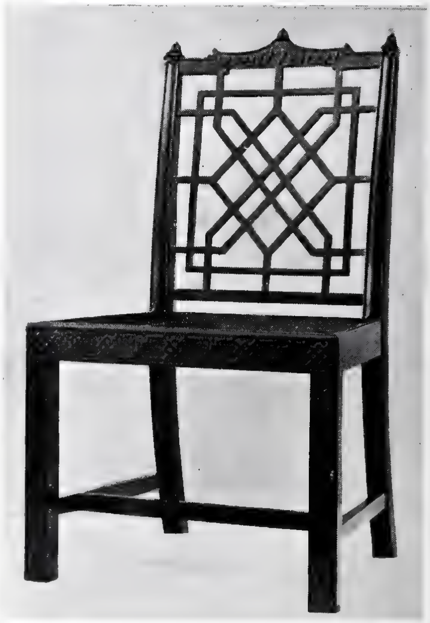
Courtesy, Irving & Casson — A. H. Davenport Co.

and in bringing into favor the better forms of the exotic types of minor building and of decoration with which his journeys to China had made him familiar. Chambers himself apparently refused to take English use of the Chinese style very seriously, properly regarding it as merely giving a whimsical humor to the setting of English life when he wrote: "These are the toys of architecture, and just as toys are sometimes on account of their oddity, prettiness or neatness of workmanship admitted into the cabinets of the curious, so may Chinese buildings be sometimes allowed a place among compositions of a nobler kind." So he added to his designs "furniture taken from some models as appear to me most beautiful and reasonable. Some are pretty, and may be useful to our cabinet makers."

The spread of the Chinese fashion in England owed much to Chippendale who often varied his handling of oriental motifs with a subtle use of Gothic and rocaille. This popular cabinet maker was possessed of a keen sense of what constituted "good business," and with a fashion set by the court and growing in vogue daily, what more advantageous to a maker of furniture than to cater to an insistent demand? So Chippendale applied himself with enthusiasm to the "development" of the Chinese, displaying a marvelous cleverness in adapting Chinese pagodas, mandarins, dragons and bells as ornament to furniture of Georgian design, the result made gayer and more fantastic by the use of gold and much color. He was particularly successful with his cabinets, sometimes standing and sometimes hung upon walls, popular for displaying the pottery and porcelain which it was the fashion of the day to collect, and these cabinets abounded in pagodas, fringed

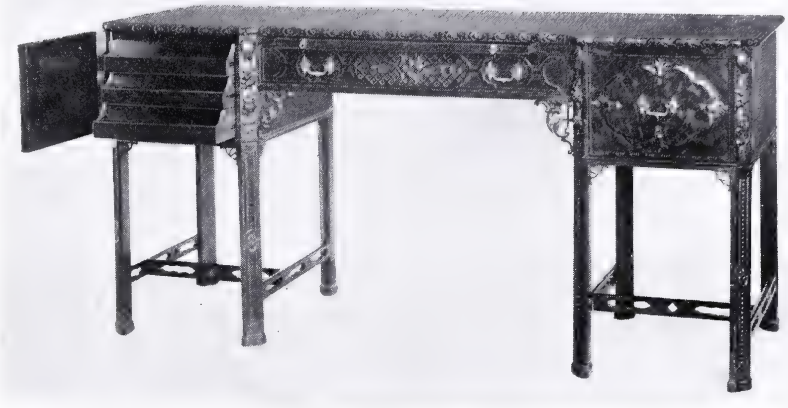


Rice Paper Panels in the Manner of Early Screen Painting for Georgian Decoration
Private Dining Room, Colony Club, New York
Delano & Aldrich, Architects



Side Chair in which Simple Right Angle and Diagonal Lines Give the Eastern Feeling

Courtesy, Irving & Casson — A. H. Davenport Co.

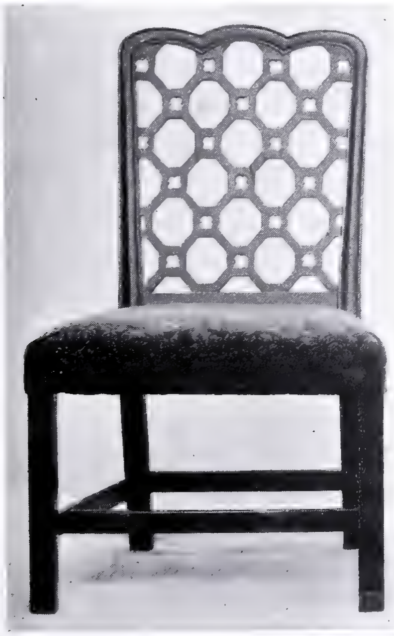


Georgian Desk Table with French Dominance of Chinese Principles. Length, 62 inches
Courtesy, Nahon Co.

about with tiny bells, or sometimes crowned with pediments, broken or complete, in which the classic forms were modified by considerable use of Chinese frets or other ornament.

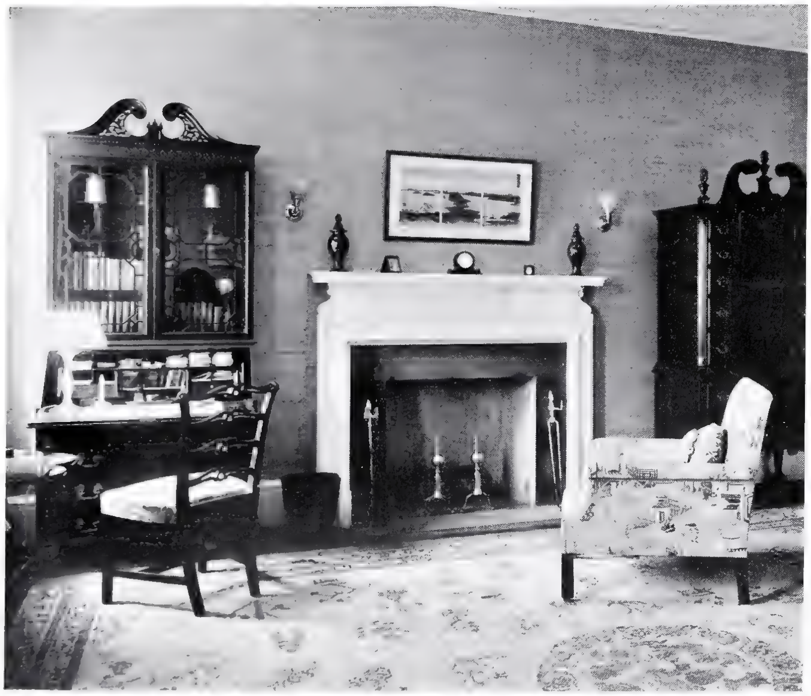
Chairs, settees and tables in the Chinese manner were characterized by square legs and fancifully pierced stretchers, ingenious employment of frets and much Chinese geometrical pattern introduced in chairbacks and used to fill the areas within the arms of armchairs. Notably prominent in the handling of surfaces is the imposing of angular running ornament in narrow sinkages, and for members in underframing the design is usually pierced, as such members are thin flat strips, vertical in section. A typical adjunct on legged pieces is the knee or bracket used at the internal angle of leg and rail which is characteristic of oriental forms. On simple straight legs, a frequently occurring treatment is the bellied sinkage between two beads or what some recognize as Chinese reeds. Among the eastern forms there is a general lapse into other decorative schools with which the users were far more familiar, and the traceries of Gothic and scrolls of Louis XV are distinguished in connection with the patterns of the Chinese.

Numerous pieces of furniture in this style which are shown in the pattern books which were published by Chippendale and his contemporaries are extreme in taste, but very few such pieces are now in existence; perhaps these designs were but whimsical conceits and were never actually carried out. Most of the furniture executed and extant shows the handling of the style considerably modified and restrained, and while losing none of its rich variety and quaint beauty it conformed to the generally accepted standards of proportion and grace which characterized other eighteenth century furniture. English traditions generally held innovations to a straight course.



Diaper Pattern in Back with Square Underframing Marks the Usual Chair
Courtesy, Irving & Casson — A. H. Davenport Co.

Association of Lacquer Finish with Pre-Georgian Periods was Partly Responsible for the Fostering of Oriental Design in Chippendale's Time

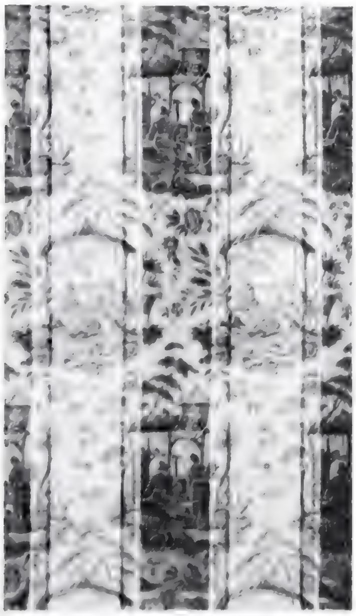


"Chinoiseries" with the Dignity to Withstand Refinement in Other Pieces in Sitting Room of New York House. Harry Creighton Ingalls, Architect

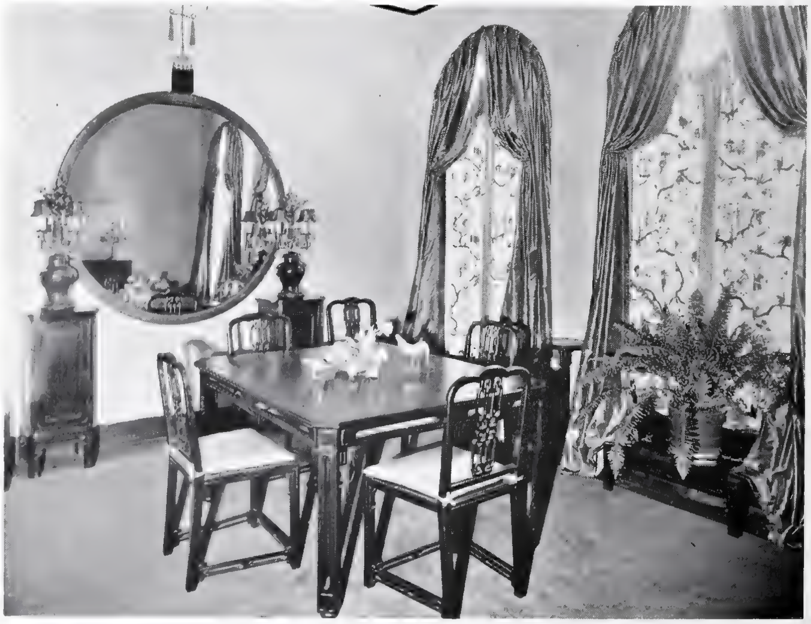
In the designing of his mirrors Chippendale went to the extreme in the use of motifs—the glass surfaces crossed by numerous fancifully designed strands of ornament and the frames ornamented with long-beaked birds, rockwork and dripping water, Chinese figures of every conceivable sort, temples, and entire scenes from Æsop's Fables given a Chinese setting—all this used on mirrors and overmantels carved from pine and thickly gilded, with certain parts highly burnished. Notwithstanding all this excess in ornament Chippendale's mirrors possessed fine form as a whole—he never lost sight of the essential lightness and grace. His chairs he described as "very proper for a lady's dressing room," while in his book he refers to the Chinese manner as "the most useful of any other"—which perhaps meant "most profitable."

During the late Georgian period, dominated by Adam, the following of the Chinese waned perceptibly. His taste had been formed by a study of antiquity at its very source, and such obvious frivolities as "Chinoiserie" met with but slight sympathy from him. It is said that Adam used the Chinese style but once—in a mirror frame where he placed mandarins holding classic garlands at the top and Chinese bells among Italian arabesque work about the frame.

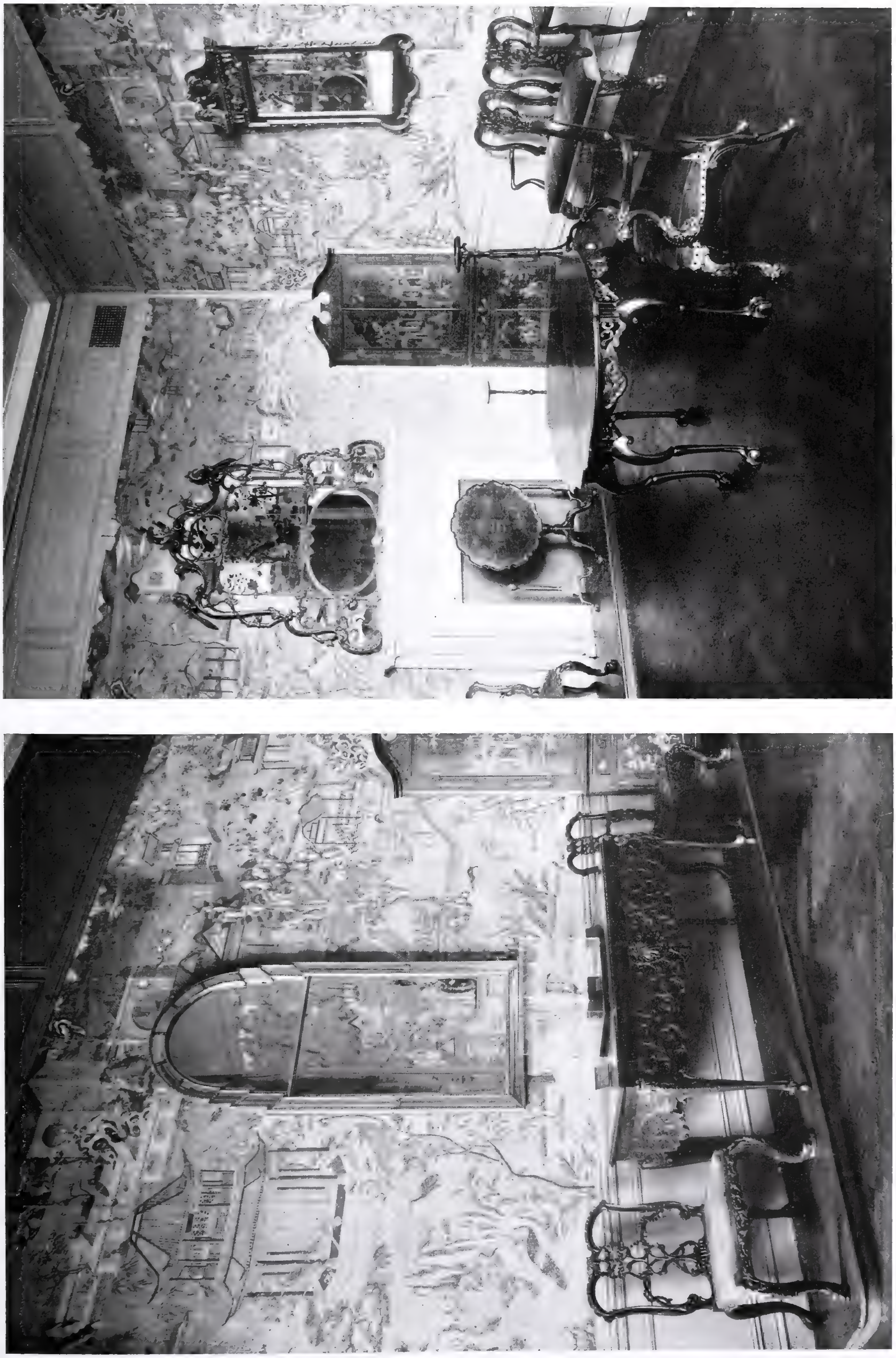
Along with the "Chinoiserie" made popular by the English court the eighteenth century saw a certain use of the "singeries" style in England, this delightful whimsicality going far beyond even the Chinese in extravagance and showing monkeys playing the rôles of horsemen and sportsmen, giving lawn fêtes and engaged in most of the occupations which concern human beings, all this being given a background of tropical scenery.



Damask in Delicately Colored Stripes with Pattern of Black Threads Width shown 25 ins.

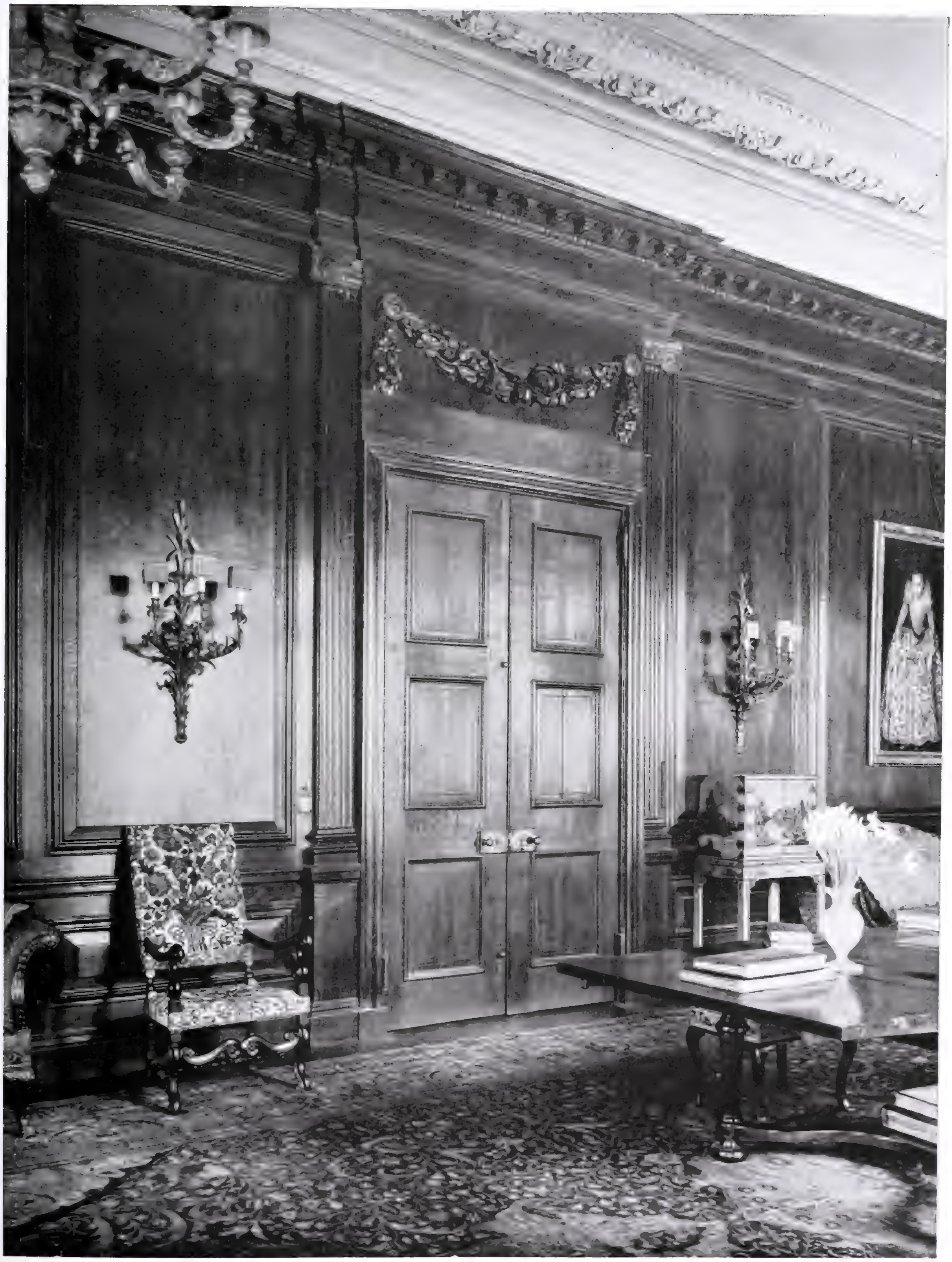


The Present-day Use of Chinese Motifs Shows a More Faithful Copy of Original Forms. This Room has Yellow Walls, Jade Carpet, Flame Taffeta Hangings and Ebony Furniture
Chamberlin Dodds, Decorator



THE CHINESE CHIPPENDALE ROOM
METROPOLITAN MUSEUM OF ART, NEW YORK

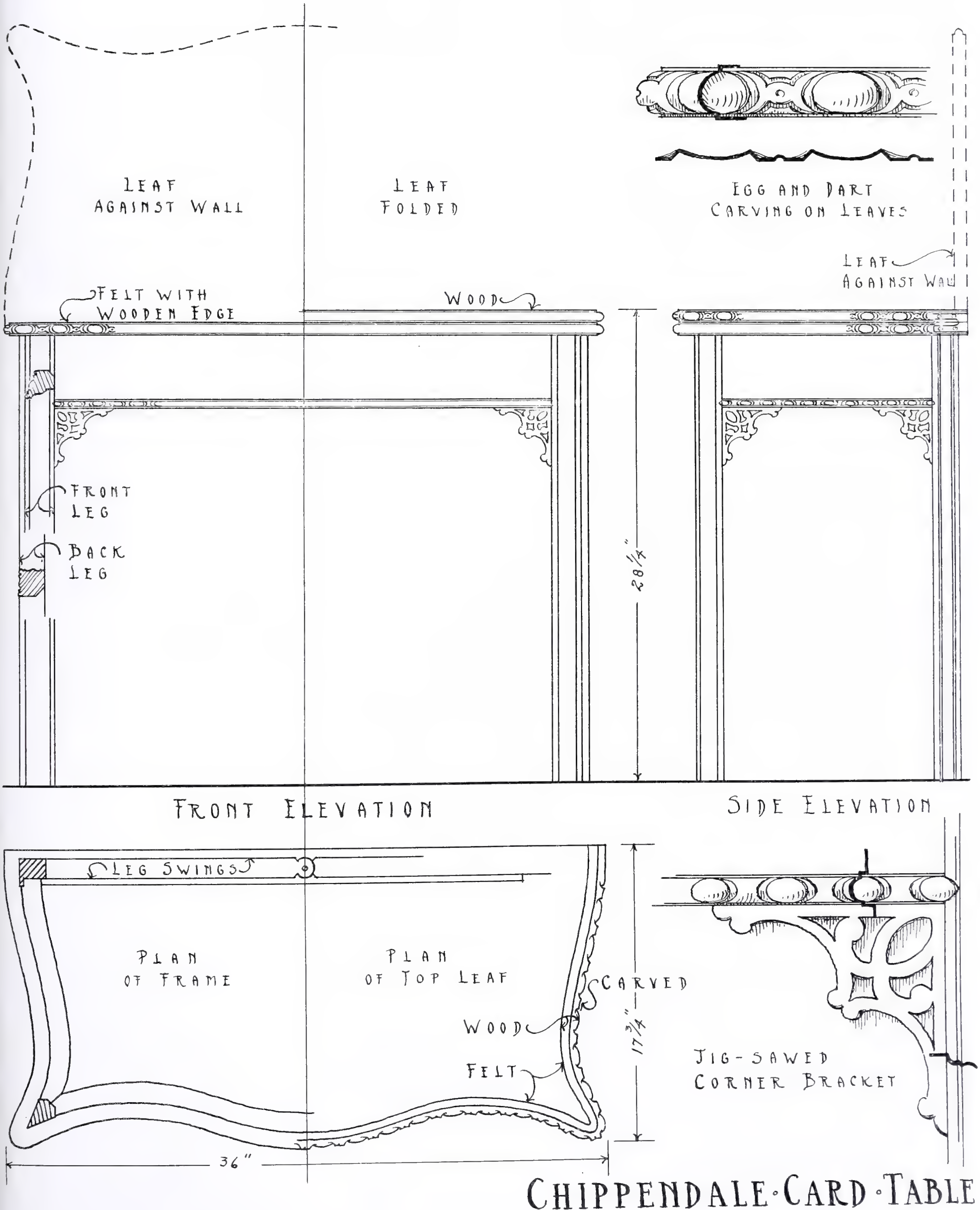
Characteristic Chinese wall paper with green ground from old English house as background for collection of richly carved late Chippendale originals. Wall paper panels are 9 ft. high

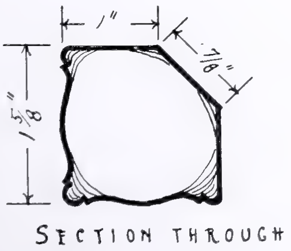


DETAIL OF LIVING ROOM DOORWAY, HOUSE OF HENRY P. DAVISON, NEW YORK

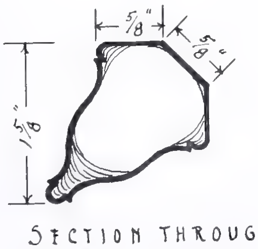
WALKER & GILLETTE, ARCHITECTS LENYGON & MORANT, DECORATORS

Large scaled oak paneling of pre-Georgian character affording excellent background for English furniture of various related periods





SECTION THROUGH BACK LEG

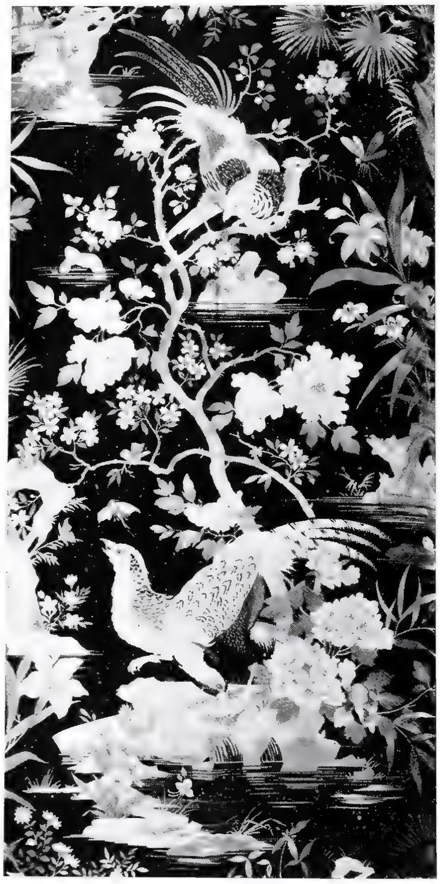


SECTION THROUGH FRONT LEG

CHIPPENDALE·CARD·TABLE

SHOWING CHINESE INFLUENCE
FROM
THE METROPOLITAN MUSEUM OF ART
NEW YORK CITY
ENGLISH — 1760-1770 — MAHOGANY

ELEVATIONS $1\frac{1}{2}$"=1'-0" DETAILS 1/2 FULL SIZE
MEASURED AND DRAWN BY RACHEL C. RAYMOND



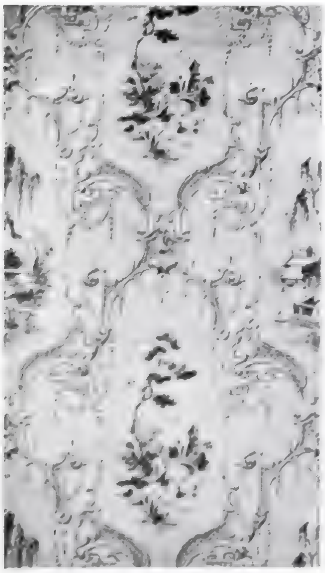
Brocade in Galaxy of Color Picturing Birds and Foliage of Eastern Genera. Width, 29 ins.

This quaintest of all conceits reached England not from Holland but from France, the painters, Jean Francois Clermont and Jean Pillemont both worked in England, and the use of this type of decoration—chiefly in the form of paintings upon ceilings or panels—possesses a certain charm.

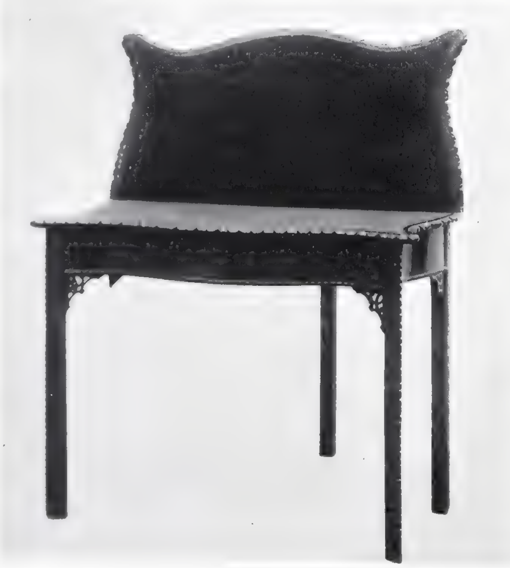
The vogue of the Chinese has frequently been revived since its beginning in the eighteenth century, and the style affords to architects and decorators today the same opportunities for introducing variety and delicacy which it did two centuries ago. The use of the style offers boundless opportunities for the introduction of superbly rich colors such as buff, yellow, orange, the deep shade sometimes called "cinnabar red" and various subtle shades of green. These colors may be used in the painting of woodwork and carried further in wall coverings and window and door draperies.

Wall papers in the Chinese taste are being made in numerous different types—rich and gorgeous in a riot of such colors as would create a suitable background for furniture of walnut or mahogany, or in neutral grays or browns, or else so designed that the entire wall spaces of a room may form one continuous picture of Chinese character which in itself would constitute decoration of a high order. Painted woodwork and wall papers which are printed in bright colors are often "toned" and tied together by glazing both wood and paper with a thin varnish mixture which brings something of the mellowed appearance of old Chinese screens. When all-over wall decorations are desired the Chinese patterned wall papers offer a useful expedient, and to a limited extent in small rooms of intimate character architectural use of Chinese pierced fretwork on friezes and dado caps gives a distinct note of quaintness. Fabrics offer added opportunities for the introduction of high notes of decoration, and it is doubtful if at any period the markets have so abounded in textiles of cotton, linen, silk or other materials, bearing patterns so rich and distinctive. These fabrics are full of the splendor of the East.

The occasional use of furniture embodying Chinese motifs creates another note of quaintness. Its choice undeniably has its legitimate and special function. Entire rooms thus furnished would be generally unwise, but when used within the bounds of good taste the style holds forth many delightful possibilities which can be attained in no other way.



Wall Paper Showing Temples and Bridge in Rococo Setting



Chippendale Card Table from the Metropolitan Museum of Art, Shown by Measured Drawing on Previous Page

Design Typical of "Chinoiserie" Papers

Wall Papers, Courtesy, W. H. S. Lloyd Co.

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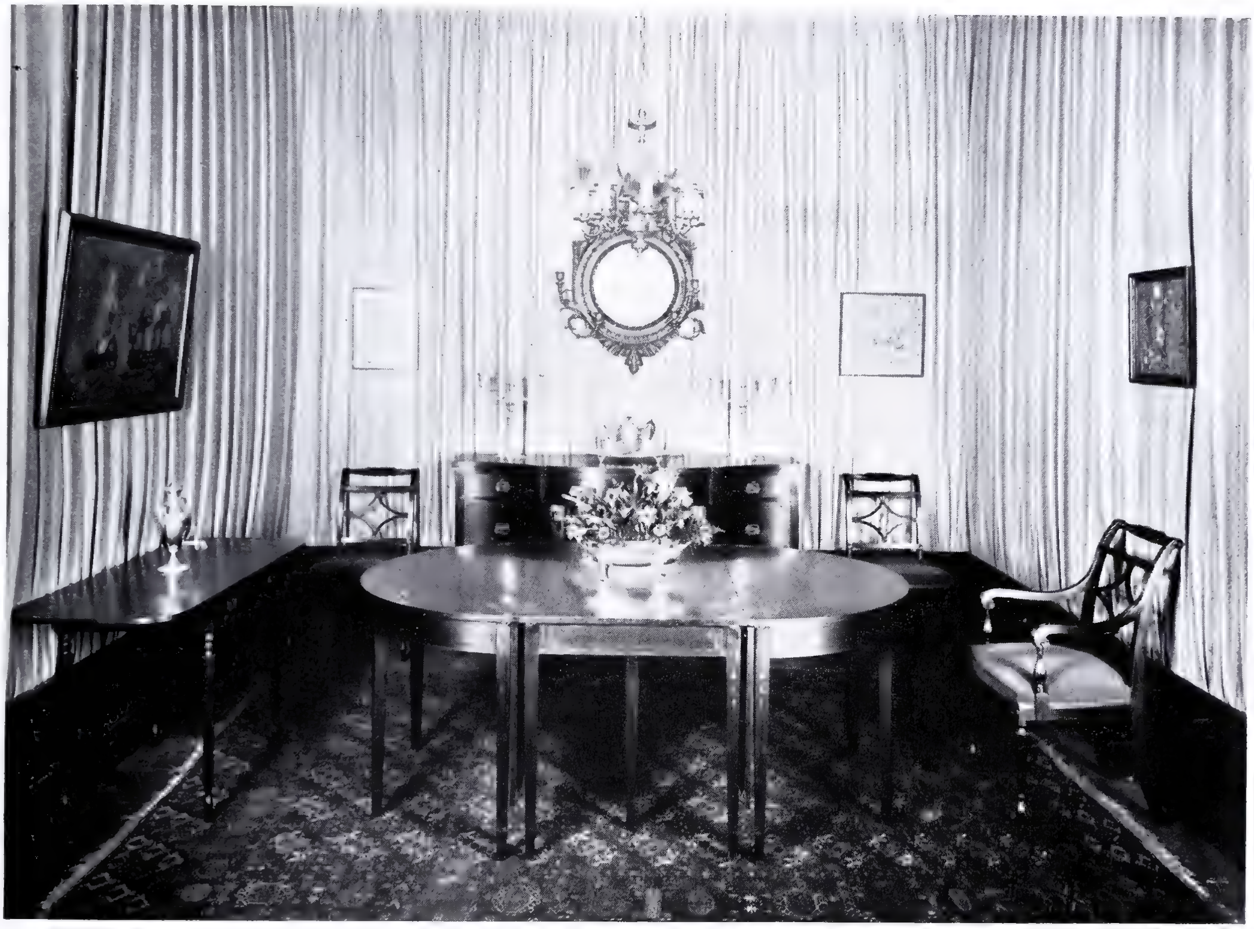

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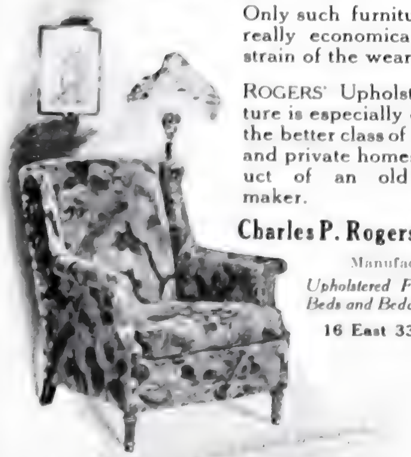

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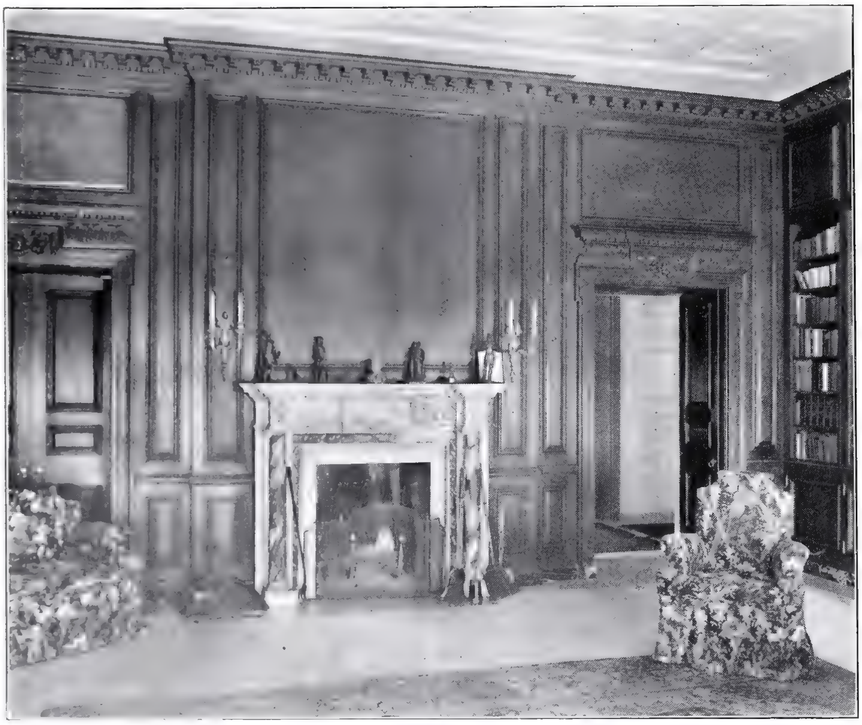

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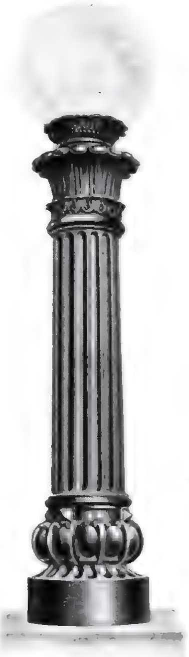

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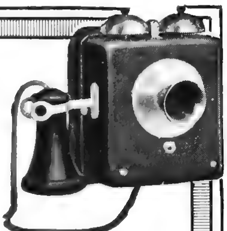

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The Standard Contract Documents of the American Institute of Architects are now on sale by dealers in office and drafting supplies in all of the large cities of the country.

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Cover (heavy paper with valuable notes)	.01
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Complete trial set prepaid for thirty cents in stamps

These Documents have received the full approval of the Institute, through its Conventions, Board of Directors and Officers. They are the outcome of continuous work of many years by a Standing Committee on Contracts and Specifications. This Committee, comprising some of the ablest American architects, was assisted by the Institute's forty Chapters; advised by eminent legal specialists in contract law, and aided by representatives of the leading construction interests of the United States. The forms have been officially approved by the National Association of Builders' Exchanges, the National Association of Master Plumbers, the National Association of Sheet Metal Contractors of the United States, the National Electrical Contractors' Association of the United States, the National Association of Marble Dealers, the Building Granite Quarries Association, the Building Trades Employers Association of the City of New York and the Heating and Piping Contractors National Association.

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Circular of Information on Fee Plus Cost System (Owner-Architect)	.03
Form of Agreement between Owner and Contractor (Cost Plus Fee Basis)	.10
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Notice to Architects, Builders and Contractors

All of the above Contract Forms and Circulars may be obtained singly or in lots from local dealers. If your dealer cannot supply you promptly and at the above prices send your order and his name to the Executive Secretary, A. I. A., The Octagon House, Washington, D. C. Sample documents mailed upon receipt of stamps. Remittances may be by check, money-order, cash or stamps.

All orders filled on the day received. Transportation prepaid on those amounting to $1.00 net or more.

The adoption and consistent use of these contract forms is recommended to the Architect who wishes his office to be known for its thorough, incisive business methods.

THE ARCHITECT'S ATTITUDE TOWARD THE PIPE ORGAN

When the builder of a house asks about a pipe organ the architect sometimes has a prejudice against it. He has a vague idea that he will not find the organ builder helpful, that an organ will not work out well—will not do him credit.

It is our desire to remove that prejudice. We believe that no architect who has installed an Estey Residence Organ feels that way. Unfortunately not many architects have organ installations often enough for their experience to count in our favor.

So we want every architect to know that we have both the will and the experience to make the relation a pleasant and satisfactory one.

THE ESTEY ORGAN COMPANY

Brattleboro, Vermont

These Armstrong Inset Tile Designs are exceptionally effective when used with borders of plain linoleum, of which the newest development is black.

Where a Floor May Be Decorative

THE decorative qualities of floors are too often ignored. In a sun porch, for example, the floor should be a distinct decorative feature. A floor of Inset Tile Linoleum, bright hangings and wicker furniture will make the most unprepossessing sun porch blossom like a rose. These inset tiles come in a variety of rich, virile colors which are harmonious enough for a sun porch, without being unduly obtrusive.

¶ Of course, much of the value of linoleum floors depends on how they are installed and how they are cared for. To insure the maximum of wear and to present a faultless appearance, a linoleum floor should be firmly cemented down over a lining of deadening felt, which has itself been all-over pasted to the wood or concrete underfloor. A thorough waxing, followed by a regular polishing, endows such a floor with a lovely sheen, without making it slippery. Such linoleum floors are permanent. They are easily cleaned and kept clean. The wealth of color and design in which Armstrong's Linoleum is made affords almost unlimited artistic effects.

¶ The portfolio, "Decorative Floors," which contains surprisingly artistic interiors in color, will give you a new idea of the possibilities of linoleum floors. Ask for a copy—there is no charge.

Armstrong Cork Company
Linoleum Department *Lancaster, Pa.*

Armstrong's Linoleum
for Every Floor Ⓐ *in the House*

R59

A STAIR-HALL is given the maximum brightness and cheerfulness when painted with Dutch Boy White-Lead and Flatting Oil. Dutch Boy flat paint is no more costly than other paints, spreads 50% farther than most paints, and can be tinted any color. The finish is soft and cheerful, free from glare. Washable. Durable.

Further information supplied promptly on request. Ask for Painting Helps No. 2

Dutch Boy

Products for Interior Painting

NATIONAL LEAD COMPANY

New York Boston Buffalo Chicago
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JOHN T. LEWIS & BROS. CO., Philadelphia
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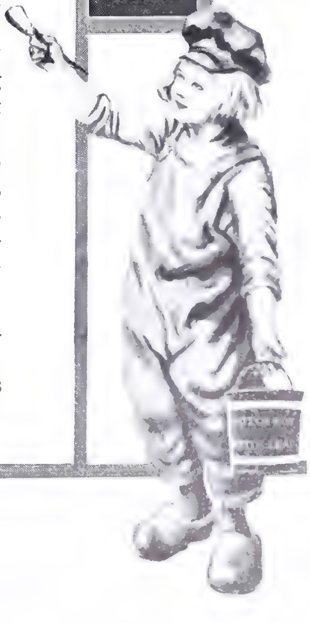
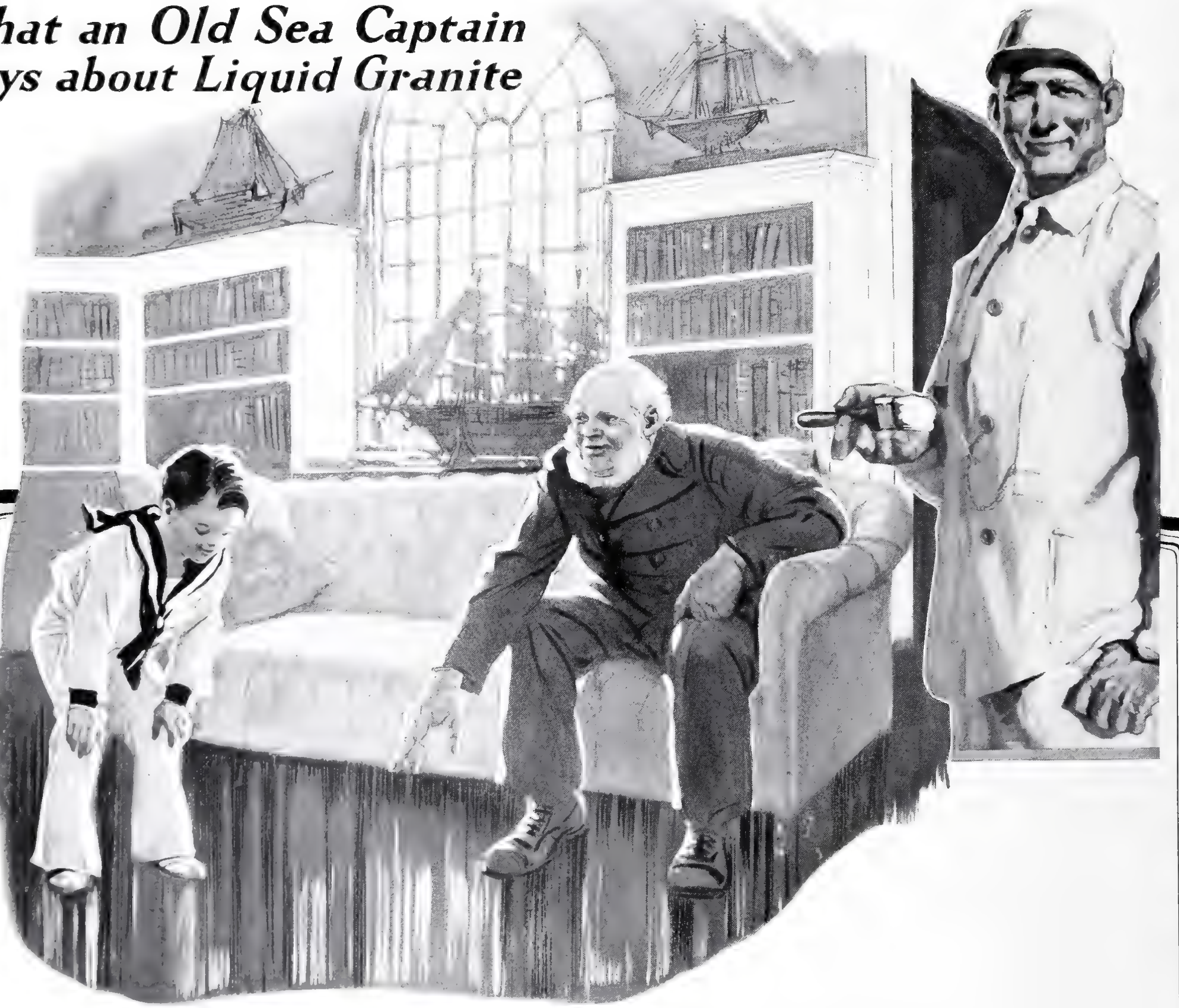
"Save the surface and you save all"-Paint & Varnish



What an Old Sea Captain says about Liquid Granite



"There she is, mate—clean, tight, and tidy as the decks must be. You can rattle your tackle on that. And if a bit of sea slaps over the rail, mop it up, and no harm done."

Liquid Granite makes a floor clean, water-proof, durable, resisting the buffetings of use, standing up under occasional hard knocks and persistent daily wear.

Liquid Granite brings out the natural grain of the wood and preserves its beauty under the hardest wear. It gives a smooth, velvety surface that enhances the beauty of the rooms you plan, that delights your clients at the first, and endures through the years. Protect your floors with

Manufactured by
the makers of
Luxeberry Enamel
The Finish Immaculate

Liquid Granite
FLOOR VARNISH

"Save the surface and you save all"—Paint & Varnish

BERRY BROTHERS
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ITS FINE GRAIN, close texture and tough fiber are particularly suited to the type of work illustrated. A wood of perfect physical and chemical make-up for white enamel, eliminating, as it definitely does, every hazard of raised grain or ultimate discoloration.

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Arkansas Soft Pine is obtainable
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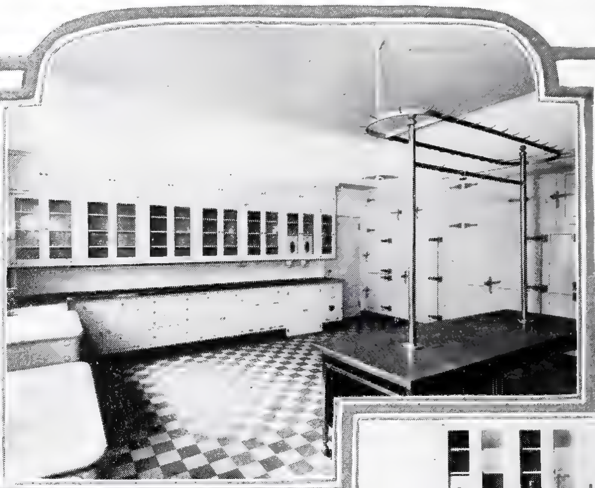
The
WHITE HOUSE
Line
SECTIONAL UNIT STEEL DRESSERS



Zeigler Residence, New York City
Sterner & Wolfe, Architects

KITCHEN, pantry and hospital equipment composed of WHITE HOUSE Sectional Steel Units fits various spaces and maintains interior beauty of proportions.

Its gleaming white-enameled steel conserves space, is more sanitary and much more durable than either wood or porcelain.

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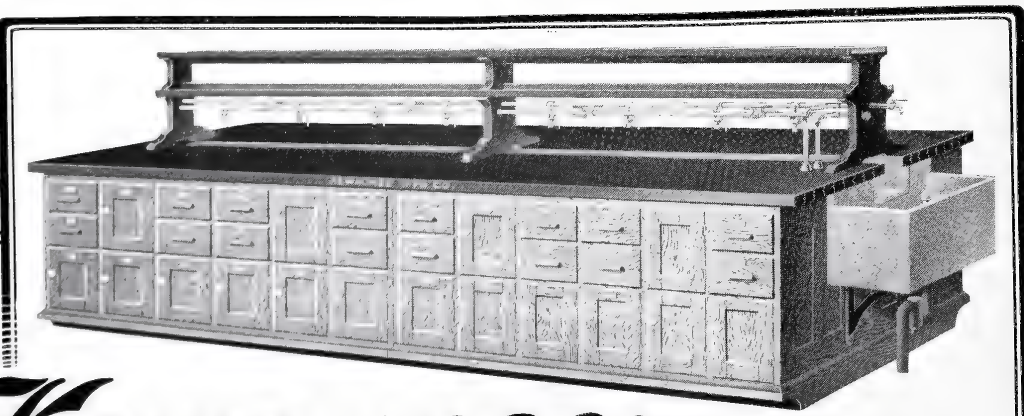

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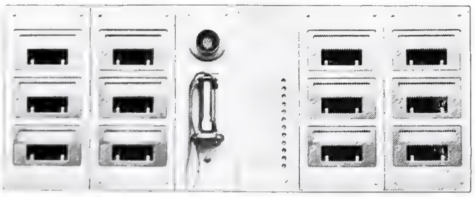

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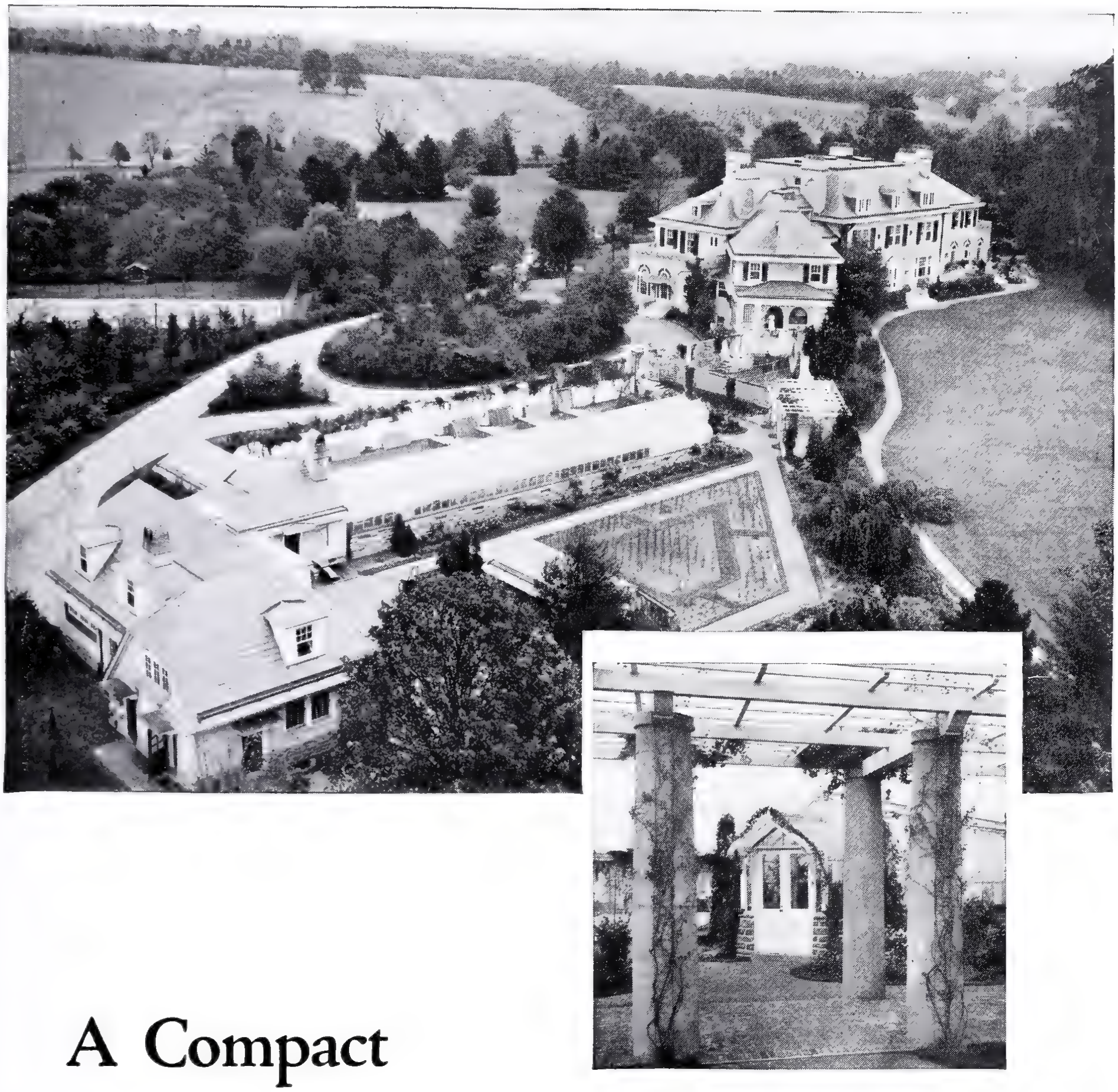

A Compact Greenhouse Linking

Coming down the residence walk this is the first glimpse you get of the greenhouse

THE greenhouse, although quickly accessible from the residence, is isolated from it.

The greenhouse, its workroom, storage shed and the gardener's cottage are all linked together.

The cold frame yard at the right of the greenhouse is both screened from the winds and the residence drive.

The iron frame greenhouse is 18 feet wide and 100 feet long, divided into several compartments, having differing temperatures.

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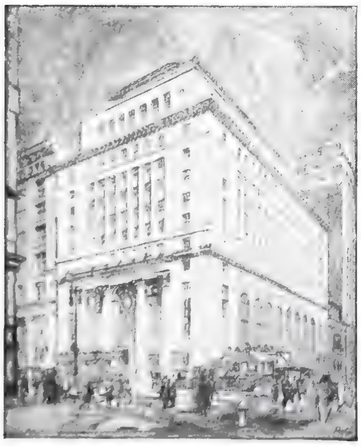

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SERVICE SECTION
of THE ARCHITECTURAL FORUM

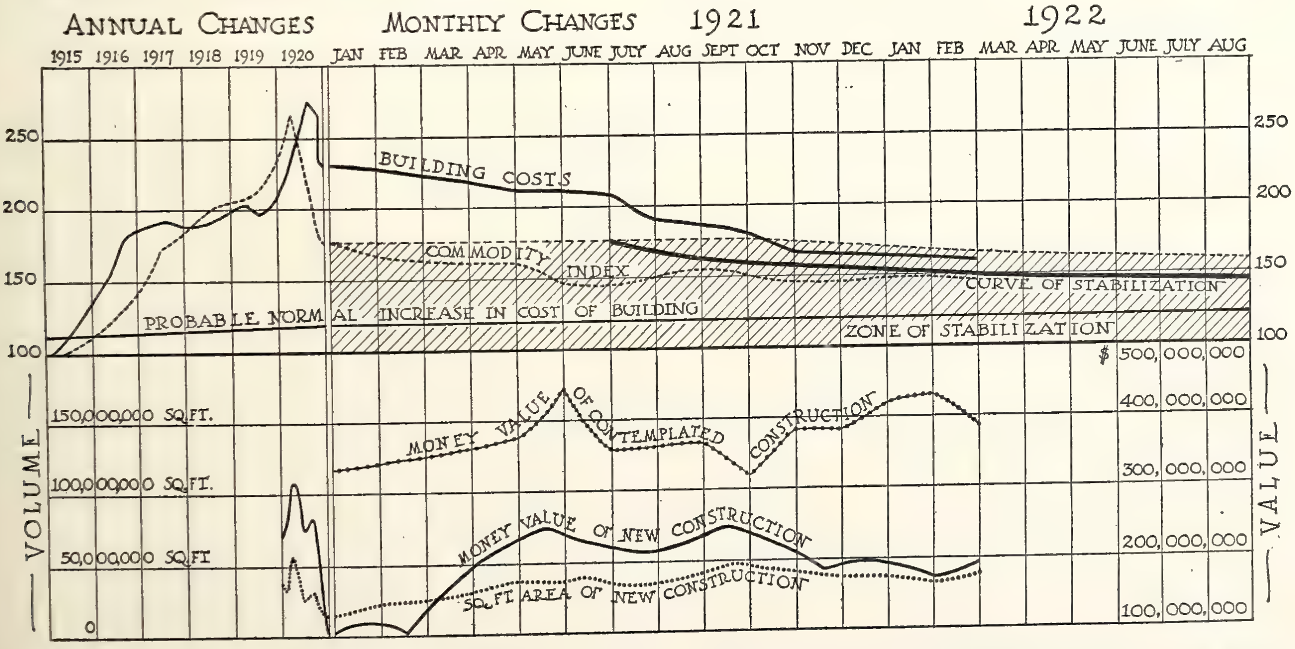
Information on economic aspects of construction and direct service for architects on subjects allied to building, through members of THE FORUM Consultation Committee

The Building Situation

THE volume of plans filed for new construction during the first two months of 1922 shows a great increase over a similar period for 1921. While there has been a seasonal drop in the actual volume of contracts let during this period, it will be noted that the upturn for 1922 had already begun in February and that the total volume of construction in 1922 bids fair to exceed that of 1921 by a large percentage.

The trend of building costs is still slightly downward, due principally to another drop in cement, steel and labor costs. In analyzing the chart below it will be noted that the index of building costs is following closely the curve of stabilization as established by THE ARCHITECTURAL FORUM early last year. This means that the confidence of building investors is mounting rapidly because they are learning that we have really entered the period of stabilization in building costs and that there is no danger of too great a depreciation in the replacement value of buildings constructed now.

Within the past few weeks there has developed in many architectural offices an optimistic outlook as to the near future in the building industry. Already a number of projects which have been held up for many months are proceeding from the stage of sketch plans into that of actual working drawings and specifications, ready for the letting of contracts. The outlook for financing of new buildings is becoming brighter every month. Most of the large loaning institutions have funds available for building and permanent mortgage loans, and a return of public confidence in mortgage bond investments is reported generally. All basic trends point to a period of prosperity in the building construction industry. The confidence of prospective investors is being rapidly reëstablished; labor is settling down to a sound basis of production; the flow of money into building channels is increasing, and contractors are now able to figure with a fair degree of accuracy. Architects have reason to expect a developing volume of business.

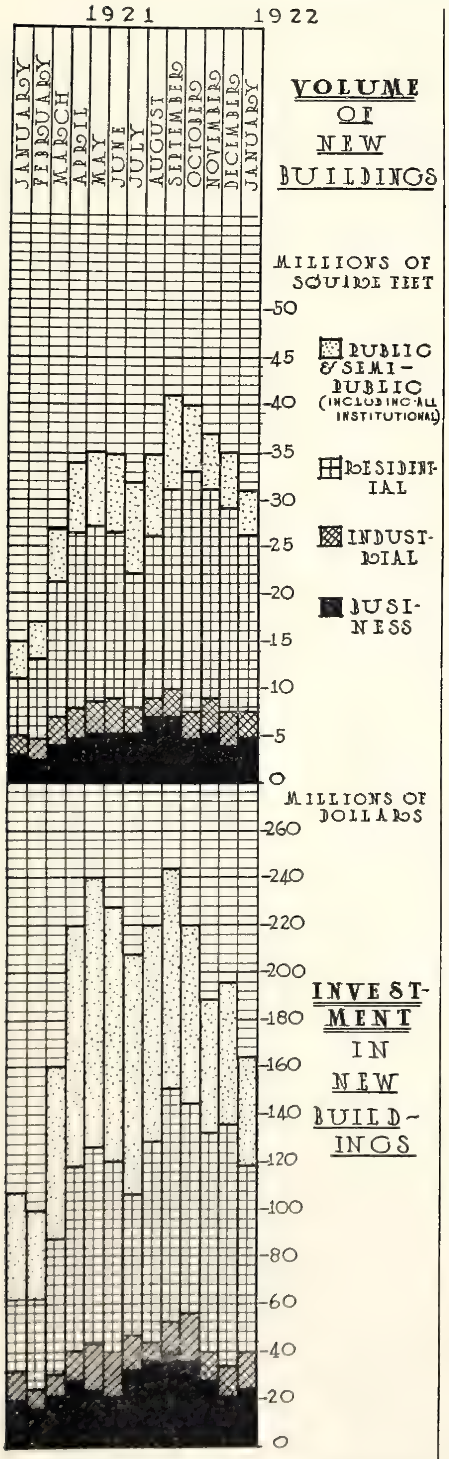


THIS chart is presented monthly with trend lines extended to the most recent date of available information. Its purpose is to show actual changes in the cost of building construction and the effect upon new building volume and investment as the *index line of building cost* approaches or recedes from the "curve of stabilization."

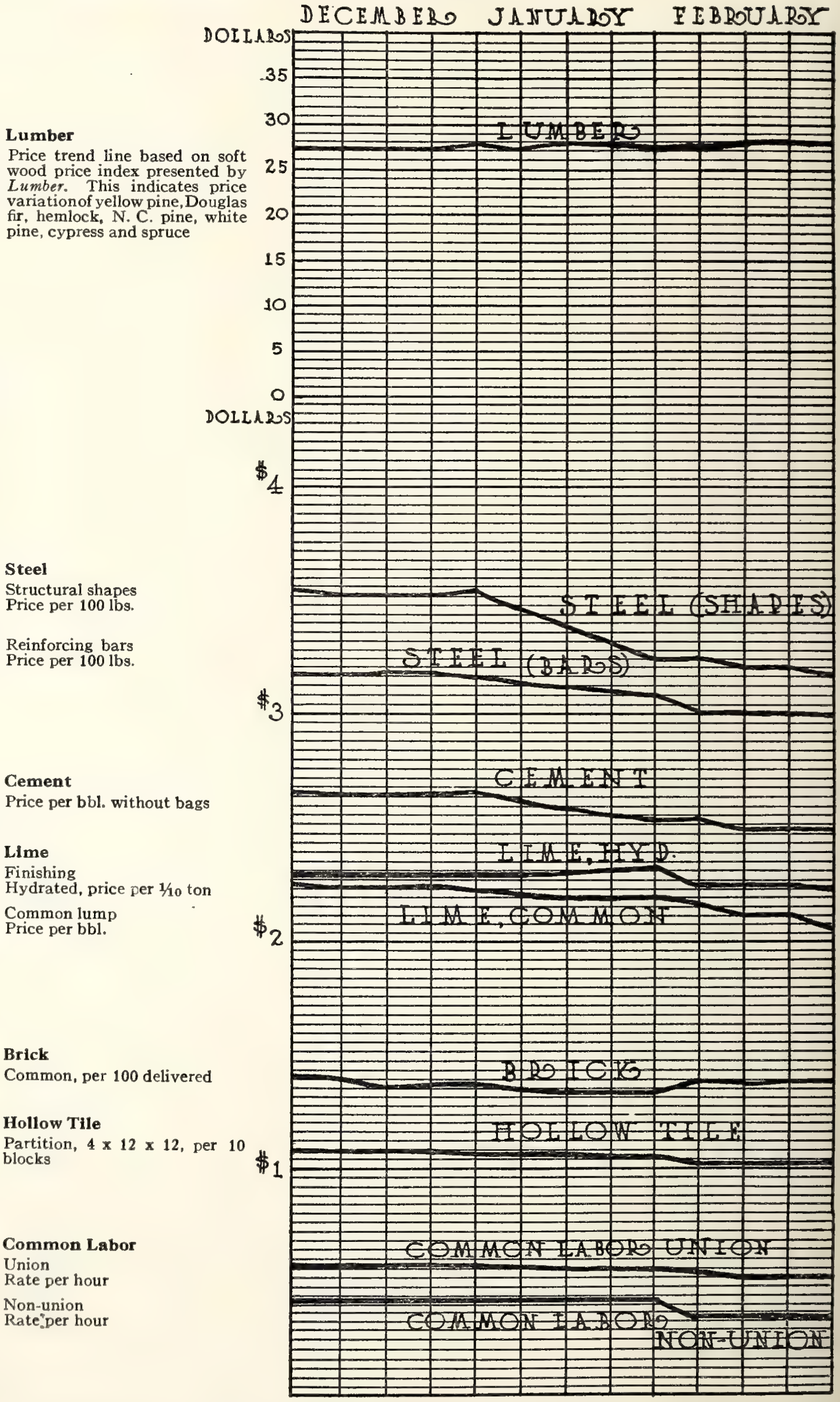
The CURVE OF STABILIZATION represents the building cost line at which investors in this field may be expected to build without fear of too great shrinkage in the reproduction value or income value of new buildings. The index line representing actual cost of building entered the ZONE OF STABILIZATION in the fall of 1921. If this cost line passes *out* of the zone of stabilization, building volume will decrease materially.

The degree of the curve of stabilization is based on (a) an analysis of time involved in return to normal conditions after the civil war and that of 1812; (b) the effect of economic control exercised by the Federal Reserve Bank in accelerating this return after the recent war, and (c) an estimate of the probable normal increase in building cost.

Factors of Fluctuation in Building Costs



Analysis of new construction showing comparative importance of major building types in volume and investment.



Figures used in developing all trend lines represent average prices to contractors in following cities: New York, Chicago, Denver, Seattle, Minneapolis, Atlanta, Dallas and San Francisco

THE chart at the left shows in square feet and in dollars the volume of new building construction since January, 1921. It will be noted that the volume for each month is divided into four building types. This makes possible a comparison of the amount of money spent in each of these divisions of the building field in relation to the volume of new buildings developed. It is interesting to note that while the area of new construction in public and semi-public buildings is much smaller than in the residential types, the amount of money expended is almost as great. This indicates a comparative value of the costs per square foot.

The cost trend of the material market is still slightly downward. It will be noted in the chart at the right that there has been a slight decrease in the cost of steel, cement and labor. Negotiations are now under way between some of the railroad interests and lumber producers to see if it is not possible to develop a simultaneous reduction of lumber prices and freight rates. It is to be hoped that these negotiations will prove successful.

Manufacturers who have recently cut prices have been surprised at the strength of the buying movement which lies just under the surface. It is to be noted that the lines indicating labor cost would have a sharper downward trend if we could introduce the element of increased production on the part of building trades labor as outlined in the March issue.

BUILDING MATERIAL PRICES

Table Showing Average Prices Paid by Contractors for Building Materials at Local Distributing Points as of Feb. 1, 1922. Prepared by Division of Building and Housing of the Department of Commerce from Prices Secured through the Bureau of Census

Commodity	Size or Condition	Unit	Mass.		N. Y.	Penn.		Md.	W. Va.	S. C.	Mich.		Wis.	Ia.			Ill.		Missouri	
			Haverhill	Fitchburg	Buffalo	Pittsburgh	Erie	Baltimore	Fairmont	Columbia	Detroit	Saginaw	Milwaukee	Cedar Rapids	Waterloo	Des Moines	Chicago	Rock Island	Kansas City	St. Joseph
Common Brick		1,000	$20.00	$18.00	$17.12	$16.00	$15.75	$12.50	$21.12	$10.50	$16.50	$12.00	*$13.00	$14.00	$15.40	$18.00	$11.00	*$13.90	$16.50	$18.00
Portland Cement	Excl. of containers	Bbl	.....	2.57	2.36	2.02	3.00	2.50	2.20	2.90	2.85	2.23	*2.30	2.26	2.33	2.56	1.87	*2.35	2.80	3.00
Yellow Pine No. 1	Dimension 2x4-16′ S1S1E	M.	60.00	53.00	32.00	45.00	.....	47.50	33.50	.....	40.50	45.00	35.00	.....	38.00	42.00	41.00	47.50	38.50	42.00
Douglas Fir No. 1	Dimension 2x4-16′ S1S1E	M.	.....	.....	.....	.....	.....	.....	.....	.....	40.50	47.00	38.00	40.00	38.00	49.00	.....	.....	34.00	.....
N. Carolina Pine No. 1	Dimension 2x4-16′ S1S1E	M.	.....	33.00	.....	.....	.....	35.00	.....	17.00	40.50	.....	.....	.....	.....	.....	.....	.....	.....	.....
Common Boards No. 1	1x6	M.	40.00	45.00	29.50	43.00	.....	35.00	33.50	20.00	.....	37.50	33.00	35.00	34.50	39.00	36.00	57.00	43.00	38.00
Y. P. Flooring E.G."C"	1x4-10′-16′	M.	57.00	69.50	.....	68.00	.....	50.00	60.00	.....	.....	60.00	.....	86.00	94.00	.....	.....	80.00	75.00	75.00
Douglas Fir V.G. No. 2	1x4-10′-16′	M.	.....	.....	.....	.....	.....	.....	.....	.....	67.50	63.00	.....	90.00	94.00	88.00	.....	100.00	.....	.....
Red Cedar Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	6.00	7.50	5.70	5.25	5.50	.....	4.80	5.00	4.53	5.00	.....	6.00	7.50	6.35	.....	5.75	5.00	6.50
Cypress Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	.....	8.50	.....	.....	7.00	.....	.....	4.50	.....	.....	5.00	.....	9.00	.....	.....	.....	6.00	.....
Composition Shingles	Crushed slate surfaced	100 sq. ft.	6.00	6.25	.....	.....	7.00	5.75	4.30	5.85	.....	6.50	6.00	5.75	8.00	6.30	.....	8.00	5.80	.....
Gypsum Plaster Board	⅜″	1,000 sq. ft.	46.00	60.00	45.00	.....	50.00	37.50	25.05	32.00	30.00	45.00	32.50	35.00	25.00	37.50	.....	55.00	32.50	33.00
Lime	Hyd. Com.	Ton	20.00	18.50	18.00	14.30	19.00	15.00	13.19	19.00	15.20	17.00	15.00	16.00	25.60	28.00	14.70	*20.00	24.00	28.40
Building Sand		Cu. yd.	2.50	1.60	.95	1.55	2.50	.95	3.50	.95	2.50	2.45	1.50	.90	1.50	1.80	2.50	*2.25	2.35	1.08
Crushed Stone	¾″	Cu. yd.	3.00	3.38	1.30	2.75	3.00	2.30	4.60	3.25	3.50	2.75	2.50	2.03	3.00	3.00	2.13	*3.25	3.00	2.75
Window Glass	Single A 10″x12″	50 sq. ft.	3.60	5.40	3.90	2.80	.....	4.50	4.20	4.09	3.60	5.40	.....	.....	7.00	6.00	.....	.....	4.50	4.80
Hollow Tile	8″x12″x12″	Each	.26	.20	.19	.15	.18	.17	.16	.14	.....	.16	.15	.12	.12	.14		*.13	.22	.....
Cast Iron Pipe	4″ E.H. 13 lbs. per ft.	Ton	.....	.....	58.80	47.50	.....	.....	41.50	.....	53.00	50.00	.....	.....	45.00	52.30	.....	.....	.....	50.00
Steel Pipe	1″ galv.	100 ft.	10.00	.....	10.00	7.82	.....	.....	7.60	9.00	.....	10.00	.....	9.61	9.59	10.00	.....	.....	.....	9.84
Reinforcement Bars	¾″ square	100 lbs.	2.40	2.50	1.79	1.55	.....	2.50	2.00	3.20	2.60	2.85	*2.60	2.75	2.10	2.75	....	2.35	2.90	3.00
Structural Steel	Fab. 6″ I-beams	100 lbs.	4.00	5.00	2.65	1.65	.....	2.60	3.25	3.50	3.50	3.00	3.50	4.00	3.20	3.35	.....	.....	3.75	.....
Gypsum Plaster	Neat	Ton	22.00	20.00	13.50	13.40	24.00	.....	14.90	16.90	19.00	15.00	26.00	14.20	13.60	17.50	.....	*17.00	15.50	17.50
Roofing Slate	No. 1 Ribbon	100 sq. ft.	.....	15.50	8.00	10.50	.....	.....	10.25	12.00	.....	.....	.....	.....	22.00	.....	.....	.....	.....	.....
Tar Paper, Roofing	2-ply 75 lbs. per roll of	100 sq. ft.	2.25	3.50	2.00	1.95	2.15	.....	.....	2.15	.....	2.75	.....	1.10	2.45	3.00	.....	1.90	....	2.44
Rosin Sized Sheathing	3-ply 30 lbs. per roll of	500 sq. ft.	1.50	2.00	1.00	1.35	.85	.75	.90	1.00	.....	.....	.....	1.10	1.47	1.20	.....	1.30	1.20	.....

*F.O.B. job

Commodity	Size or Condition	Unit	Mo.	Ohio					Ky.	Ark.	La.		Tex.	Wash.		S. D.	Calif.			Ariz.
			St. Louis	Akron	Warren	Cincinnati	Toledo	Dayton	Louisville	Little Rock	Shreveport	New Orleans	San Antonio	Tacoma	Seattle	Sioux Falls	San Francisco	San Diego	Pasadena	Tucson
Common Brick		1,000	.....	$13.50	$18.00	.....	.....	*$17.50	$15.00	$12.50	*$15.00	$12.25	$16.00	$16.00	$15.00	$18.00	$15.50	$20.00	*$17.00	$17.00
Portland Cement	Excl. of containers	Bbl.	*$2.70	2.53	2.85	$2.40	$2.98	*3.32	2.38	3.75	*3.80	2.60	3.30	3.35	3.54	2.50	2.55	4.00	*3.30	4.40
Yellow Pine No. 1	Dimension 2x4-16′ S1S1E	M	*39.00	37.00	48.00	36.50	41.00	*45.00	42.50	30.00	*39.00	.....	45.00	.....	.....	.....	.....	.....	.....	.....
Douglas Fir No. 1	Dimension 2x4-16′ S1S1E	M	*39.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14.00	18.00	38.00	31.00	40.00	*48.00	50.00
N. Carolina Pine No. 1	Dimension 2x4-16′ S1S1E	M	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Common Boards No. 1	1x6	M	*43.00	38.00	45.00	50.00	60.00	*40.00	57.50	32.00	*41.00	.....	48.00	14.00	16.00	38.00	32.00	.....	*46.00	....
Y. P. Flooring E.G."C"	1x4-10′-16′	M	*59.00	65.00	80.00	61.00	.....	.....	66.50	45.00	*68.00	.....	75.00	.....	.....	.....	.....	.....	.....	95.00
Douglas Fir V.G. No. 2	1x4-10′-16′	M	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65.00	57.00	81.00	68.00	.....	*85.00	.....
Red Cedar Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	6.25	6.50	5.30	5.00	5.04	*5.40	6.20	4.75	*6.30	.....	7.00	4.50	3.75	5.40	5.40	.....	*6.50	5.50
Cypress Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	.....	.....	.....	.....	.....	.....	.....	4.50	*7.65	.....	9.50	.....	.....	.....	.....	6.00	.....	.....
Composition Shingles	Crushed slate surfaced	100 sq. ft.	5.90	.....	8.50	5.75	6.75	*6.50	6.00	6.50	*8.00	6.50	.....	.....	7.50	8.00	.....	.....	.....	.....
Gypsum Plaster Board	⅜″	1,000 sq. ft.	45.00	47.50	40.00	.....	45.00	*37.50	38.00	35.00	*50.00	50.00	52.00	40.00	42.50	45.00	42.22	39.00	*44.40	65.00
Lime	Hyd. Com.	Ton	20.00	17.00	18.00	12.00	.....	*14.00	.....	24.00	*24.00	13.25	22.50	23.00	24.00	20.00	22.00	28.00	*32.00	16.50
Building Sand		Cu. yd.	2.63	1.65	3.00	1.40	*2.25	*1.85	.....	1.00	*2.25	1.35	2.75	1.25	1.50	.....	1.50	3.00	*2.00	1.10
Crushed Stone	¾″	Cu. yd.	.....	3.25	3.00	1.90	*3.00	*2.30	.....	2.00	*5.25	2.25	2.60	1.50	.....	.....	2.50	3.40	*3.75	3.00
Window Glass	Single A 10″x12″	50 sq. ft.	.....	4.50	.....	.....	.....	*5.00	.....	5.00	*4.50	.....	5.40	7.50	3.55	.....	4.65	6.20	.....	7.80
Hollow Tile	9″x12″x12″	Each	.16	.12	.17	.....	.....	*.19	.....	.20	*.21	.....	.21	.25	.22	.14	.18	.22	.....	.18
Cast Iron Pipe	4″ E.H. 13 lbs. per ft.	Ton	.....	.....	49.00	.....	.....	*60.00	.....	65.00	*77.00	.....	59.00	.....	75.00	.....	49.23	.....	.....	67.50
Steel Pipe	1″ galv.	100 ft.	.....	8.36	8.70	.....	.....	*9.50	.....	11.00	*9.43	.....	9.40	13.70	10.25	.....	8.00	.....	.....	11.00
Reinforcement Bars	¾″ square	100 lbs.	2.75	2.75	2.30	.....	.....	*3.00	2.67	3.25	*3.60	.....	3.75	4.25	3.50	2.80	3.00	4.50	.....	5.00
Structural Steel	Fab. 6″ I-beams	100 lbs.	.....	2.75	3.00	.....	.....	*4.00	2.30	3.50	*4.00	.....	.....	5.50	5.90	3.20	3.75	.....	.....	.....
Gypsum Plaster	Neat	Ton	19.50	19.00	19.00	.....	.....	....	.....	27.00	*24.00	20.00	24.00	21.50	21.00	.....	16.93	24.00	*20.00	.....
Roofing Slate	No. 1 Ribbon	100 sq. ft.	.....	11.50	.....	.....	.....	....	.....	16.00	*12.00	.....	.....	17.00	.....	.....	.....	.....	.....	.....
Tar Paper, Roofing	2-ply 75 lbs. per roll of	100 sq. ft.	.....	1.40	2.50	.....	.....	*2.50	.....	2.25	*2.50	.....	.....	2.10	3.00	3.50	2.50	3.25	*2.55	3.75
Rosin Sized Sheathing	3-ply 30 lbs. per roll of	500 sq. ft.	.....	.....	.....	.....	.....	*1.25	.....	1.25	*1.25	.....	.....	.77	.75	2.00	2.00	.....	.....	1.50

*F.O.B. job

Banker's Analysis Promises Construction Activity

EXTRACTS FROM ADDRESS BY LEONARD P. AYRES, VICE-PRESIDENT CLEVELAND TRUST COMPANY

THE recovery of the construction industry is the first, most potent and perhaps the most important sign of a recovery from a period of depression. Such a recovery has begun to take place now, and we watch it with the very closest scrutiny because we are enormously interested, more than we would be in the same amount of recovery in any other industry.

I have tried to find out how much recovery in construction is occurring. Each one of those black, upright columns on this chart (Fig. 1) represents in millions of dollars the amount of building permits in the 20 leading American cities each year over the past 21 years. They are rather low in the period of hard times, the panic of 1903–1904. They come up sharply in the period of prosperity that followed. They fell off again in the period of 1907–1908, responded again to the prosperity of 1909 and the steady prosperity of 1910, 1911 and 1912, going down again in the hard times of 1913 and 1914, and then recovered.

Here on the chart (Fig. 1) are some columns partly solid, partly in outline. The first prominent one is for the year 1916 and a lower one, 1917, and a very little one, 1918. An enormous recovery is shown in 1919, a bad period in 1920, and a very great amount of money spent on construction in 1921. These last columns, partly solid and partly in outline, represent in their entire height the total amount of money spent. That building, however, was very expensive building and the money spent did not measure the amount of building actually done in the same sense that it did in earlier years, so I divided through by the increased cost of that construction each year and it shrinks these columns down to the part that is in black. The black portions show, on the same basis as for the earlier years, how much construction was actually done.

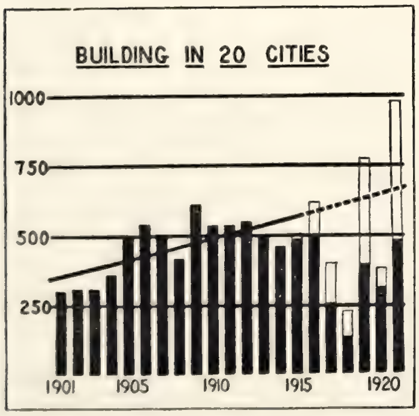


Fig. 1. Comparison of Volume of New Construction

Then I said, "Now let's find out how this business of construction in our cities is growing from year to year." So I had drawn through this diagram, from the starting point at the left over to 1915, the slanting straight line. That represents (over the first part of the period) the general trend of construction that was increasing as these cities grew in population. It is not drawn through by guesswork or by pulling a string across the upright columns or by any such method, but by the method of fewest squares, which gives us a line that a mathematician would describe as representing more accurately than could any other straight line that might be drawn the general trend of these irregularly rising columns. I continued it on up over the last abnormal period, and we can fairly say that it is the normal line.

THESE extracts from the address of the Vice-president of the Cleveland Trust Company before the Associated General Contractors constitute an unusually able analysis of present conditions in the building industry and indicate a period of extraordinary activity. The encouraging predictions of a banker and well known economist are of special value in demonstrating that a practical period of stabilized building conditions has been reached.

We may say that in these first four bad years building was below normal. Then it shot up very much above normal and made up the deficiency. In the hard times of 1908 it fell below normal, and then again it shot up and stayed up considerably above. It went down in 1913 and 1914 and was coming up when the war came on; then we have this irregular process further on. Building responds very sensitively to these changes in business conditions. It is very depressed or it is very active. The construction industry is either abnormal or sub-normal, and on the chart you see it swinging from one stage into the other, and so if we have our normal line as we have shown on the chart, we may measure the degree of variation and find out how great is the shortage or how much ahead of the natural, normal requirements in the community the thing is.

I may say I doubted a bit whether this was fully reliable, and made the same computation from the Bradstreet figures, covering 120 cities instead of 20 cities, and within a few fractional points it checked out. So I took the straight slanting line and I made it into a horizontal line right across this chart (Fig. 2) and put below the deficiencies and above the surpluses and above normal by quarters instead of by whole years. Twenty, in 1902, means 20 per cent below normal in that year, 30 per cent below in 1903 and so on. Twenty in 1905–6 means 20 per cent above normal, and the horizontal line is simply that slanting straight line on the other sheet that I have turned around until it is level.

So here we have the story of the construction industry in these 20 leading American cities, a deficiency of building in 1901 and 1902 and 1903 and 1904, a very quick recovery catching up with the deficiency and going ahead, and activities above normal in 1905 and 1906 and the first part of 1907, the panic of 1907–1908, almost a stoppage of construction, a quick recovery and back to the prosperity of 1909. Then several years, you remember them well, when we didn't have very prosperous times, and we didn't have any more panics or depressions, and construction, like other business, went along fluctuating above and below normal over quite a span of time.

Then we came into this period of restricted building that came with the great war. The government came into it and down, down it went until we get down to 1918, almost to a suspension of city building, where at the low point we were about 96 per cent or 98 per cent below normal, down almost to nothing. A brief recovery in 1919, and a very great depression again in 1920, and then the rapid recovery which has carried us up to about 11 per cent above normal on the basis of the last data that has come in. So we have here a mirror showing how construction has been fluctuating over a quarter of a century. I took those figures and said, "How far ahead or behind the game are we?" Because that is the answer that I was trying to get at—to see how the sizeup of this industry would turn out. And here (Fig. 3) I have a curved line showing the accumulated results.

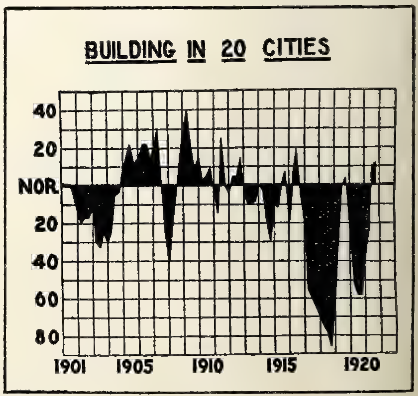


Fig. 2. Comparison of Construction Volume with Respect to Normal

If you put all these deficiencies together and then add the surpluses and subtract deficiencies again, what happens? We were even with the game when we started. We ran into those hard times of 1901 to 1904 and accumulated a deficiency of building in 20 cities amounting to more than one-half year's construction. Prosperity came and we cut down that shortage and we got it down almost to normal when the panic of 1907–1908 came along, restricted the building and the shortage came up again. In 1909 construction went ahead rapidly; the shortage was cut down until we got to normal and ahead of it and began to get a little overbuilt, and many of you can remember those years in which our city buildings were hunting for tenants. It ran along up to 1914, until in 1915 and 1916 a little shortage developed, and then 1917, 1918, 1919 and 1920, one year, two years, two and a quarter, well along toward two and a half years of shortage of building in our American cities, and I think that it will turn out to be about that figure, whether you measure it by these 20 cities or whether you take 120 cities.

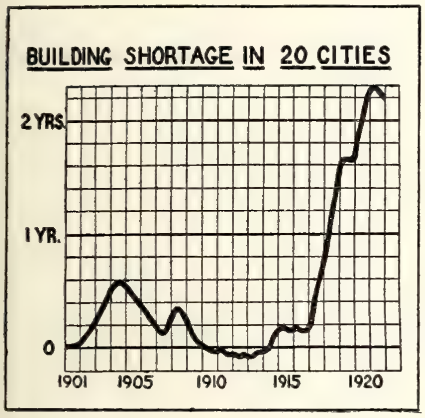


Fig. 3. Building Shortage Expressed in Terms of Annual Construction

It is not true for the country districts, insofar as I can find out, but in city buildings that in general is the condition, and we have turned the corner and started to cut the deficiency down with the active building operations of the last few months.

Let us assume that that series of computations is roughly right, and I think we may do that. What does it mean? It means that this industry, if it has ahead of it a shortage amounting to two and a quarter years of construction, is in a condition where, if we have anything resembling normal business, it can go ahead for nine years at 25 per cent above normal for the whole time.

It is not going to do that, for various other reasons, but that shortage is there. Most of it is a shortage that has to be made up—not all, because in some measure, if you use a building longer than you normally would use it, that deficiency does not have to be made up. The suit of clothes that I have on has done a year's more service than normal and I will never have to make it up; I have saved that year. But that is not equally true of buildings, for populations grow and they require more and more buildings and this normal is a very real thing. If we grow with that rapidity, it happens to our clothes, too, by the way. No other industry has any such condition confronting it. The fact constitutes an opportunity that ought, if properly managed, to turn out to be one very nearly unparalleled in our current economic situation.

Why does business recover after a depression? In these business cycles that I have talked about, several things always happen in order. When we are at the height of prosperity, running along with great profits and enormous activity, the first warning we get that such a condition is coming to an end is a break in the stock market. It always happens. About 6 months after that break, we get a break in commodity prices. About 6 months after that we get one in interest rates.

If you take the last five serious depressions in this country and go through their history, you find those three things happening in that order at almost identically that time spacing. All of them have happened this time. They have happened in that order, and the interest rates are now well down and still dropping. When they drop far enough, business men begin to see that once more they can resume business at a profit. Those who are enterprising and daring have in the past in that last stage of depression started to extend their factories or to build new ones, which is what has brought about the recurrence of construction activity in the latter part of a depression. That is why economic students, bankers and financial writers always watch for that upturn in building because they know that what it means is that money has at last become cheap enough so that progressive and enterprising business men are once more starting to build. It becomes a barometer of business.

This time the recovery of building is not of that sort. It is not typical. Watching it, as we do with greatest care, we must not let ourselves be deceived into thinking that it is that sort of enterprising business and industrial construction that has characterized the recovery from every previous depression in this country. It is not; it is something different. During these past half-dozen years of abnormal activity and great prosperity in this country we have as a nation given our effort and our attention to that type of construction that related to producing things, manufacturing things and storing, and we have neglected those things that relate to the comfort and the welfare of people, and our great shortage has grown up in that latter kind of building. And now when we return to construction activity, we find that activity is sluggish in those things that relate to the manufacture and storage of things and that it is active and stimulated in that kind of building that has to do with the comfort, the shelter and the welfare of the people.

And so we can take what happened in 1920 from the Dodge figures of what happened in 1921, and we will find these facts standing out, and we shall find, taking the money out of it by talking about square feet this time, a situation such as is shown in Fig. 4. Each pair of bars is a comparison of the amount of construction done in 1921 with that done in 1920, for one particular class of buildings. The upper bar of each pair corresponds to 1921, the lower to 1920.

The residence building this year in millions of square feet is 183 as against only 132 last year, an increase there of almost 50 per cent. Business buildings have shrunk. School building is active and getting more active. The proportion is rising and there is an enormous shortage of school buildings. Industrial construction, which in 1920 amounted to 124 million, is down to roughly one-quarter of that amount in 1921. That sluggishness still continues, and will for some time to come, in most parts of the country. Amusements, which largely mean movie theaters, are 33 per cent ahead of last year. Hospitals are well along toward double. Churches also well along toward double. Public buildings are the same as in 1920.

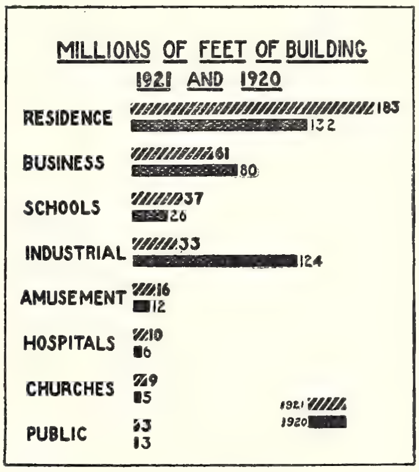


Fig. 4. Comparison of Volume in Building Types for Last Two Years

So we have these buildings that have to do with business and industry, sluggish; but residences, schools, theaters, recreation halls, hospitals, churches, public buildings, catching up with the deficiency. Of course business recovers, as it has already started to do, gradually, and I think it will be a long, slow and irregular recovery.

So I should say, in concluding, that *the outlook for the construction industry is one of a most extraordinary sort and an outlook that has an exceptional promise for good business on a falling market.* When I say on a falling market, I mean a market of falling prices for general business.

The construction industry thus enters a period of great accumulated shortage at a time when interest rates have fallen far, far below what they were and when the difficulties and problems of financing are rapidly disappearing—so rapidly that my own expectation is that within 6 months most of the acrimonious discussions that you and we have indulged in will be at an end. Thus I think the problems of financing are largely ended, because money is easy and seeking investment, prices have come down to a relative stability, and a shortage exists.

THE FORUM CONSULTATION COMMITTEE

A group of nationally known experts on various technical subjects allied to building, providing a direct service to architects

THE editors of THE ARCHITECTURAL FORUM have been fortunate in obtaining the co-operation of the following recognized experts who constitute THE FORUM Consultation Committee. This Committee provides a service of the greatest value to subscribers in addition to the usual editorial service, and architects who seek information on specific questions in these various fields are invited to present inquiries.

The basis on which this Committee has been organized is:

(*a*) That each Committee member shall be a representative leader in his line;
(*b*) That no Committee member has affiliations with any manufacturer;
(*c*) That no Committee member will be called upon for detailed service except by special arrangement;
(*d*) That a special editorial article on a subject represented under each of the headings below shall be prepared during the year by the Committee member.

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A SURVEY OF IMPORTANT CURRENT ARTICLES ON BUILDING ECONOMICS AND BUSINESS CONDITIONS AFFECTING CONSTRUCTION

The Editors of this Department select from a wide range of publications matter of definite interest to Architects which would otherwise be available only through laborious effort

WHAT SECRETARY HOOVER IS DOING FOR THE BUILDING INDUSTRY

THESE extracts are from a recent letter written by Herbert Hoover to President Harding and presented in a bulletin of the U. S. Department of Commerce:

"That there is a national shortage of houses requires no repetition. The shortage probably amounts to nearly a million homes—and is, of course, the result of suspension of building during the war. Since that time high costs of building material and labor (due also to increased intermittence of employment) have prohibited the erection of little more than current necessities without recovery of the lost ground.

"Effort has already been made by the Department of Commerce which has, I believe, at least contributed to the resumption of construction during the past few months on a scale larger than at any period since the war began. As the result of your request that this Department should interest itself in the matter (following upon the report of the Senate Committee on Housing), a sum of $50,000 was appropriated by congress for the Housing Division in this Department.

"Our first effort was through co-operation with unofficial bodies in bringing about local conferences on the housing situation in the different cities with a view to ameliorating conditions. These conferences have been held in over 100 cities. Positive plans have been worked out in many of them and great stimulation to home building has ensued; where they have gone upon the rocks it has been on account of corrupt conditions of the building trades and over wage questions.

"In addition to local effort we have created a number of agencies, mostly voluntary, for the purpose of securing constructive solution to some of the more general problems that cause the blockade on housing. Various committees have been established and are engaged in sincere efforts in these fields: the General Situation in the Construction Industry; Simplification of Municipal Building Rules; Simplification of Plumbing Requirements and Practice; Standardization of Contractors' Specifications; Expansion of Small House Design Bureaus; Simplification of Clay Products, Lighting Fixtures, Lumber, Paint and Varnish, and in many other directions. By all these agencies much good has been accomplished in a quiet and efficient manner.

"Among other things developed by these conferences was the total absence of any adequate comparative price data respecting building materials in various localities. This matter has been gradually developed in the Department, and the spread of these comparative prices to the local conferences has resulted in many reductions."

STANDARDIZING CODES

As an example of problems of national scope it was strongly emphasized in the investigation of the Senate Committee on Reconstruction that the disordered and expensive requirements of our municipal building rules are estimated to impose a 10% to 20% unnecessary cost upon housing. In this matter, the committee appointed comprised:

Ira H. Woolson, Chairman.
Consulting Engineer, Nat'l Board of Fire Underwriters, New York.
Edwin H. Brown, Architect, Minneapolis.
Chairman, Committee on Small Houses, American Institute of Architects.
William K. Hatt, Professor of Civil Engineering, Purdue University.
Director, National Research Council.
Rudolph P. Miller, Ex-Superintendent of Buildings, New York.
Chairman, Building Officials Conference.
J. A. Newlin, Forest Products Laboratory, U. S. Dept. of Agriculture.
Ernest J. Russell, Architect, St. Louis.
Chairman, Nat'l Board of Awards for Jurisdictional Disputes in the Building Industry.
Joseph R. Worcester, Consulting Engineer, Boston.

This committee is drafting a simplified set of municipal building rules embracing the best practice of the art, and this work is well advanced. It has involved a large amount of co-operation with municipalities and with different trades and professions. Arising out of this we have also appointed a committee who are hard at work upon plumbing questions:

George C. Whipple, Chairman.
Director, School of Sanitation, Harvard University.
William C. Groeniger, President, American Society of Sanitary Engineering.
William J. Spencer,
Secretary-Treasurer of Building Trades Dept., American Federation of Labor
H. Y. Carson, Research Engineer, American Cast Iron Pipe Company, Birmingham, Ala.
A. L. Webster, Sanitary Engineer, 112 East 40th street, New York.
A. E. Hansen, Sanitary Engineer, 2 Rector street, New York.
Thomas F. Hanley, Chairman,
Standardization Committee,
Nat'l Association of Master Plumbers.

This committee is making good progress, and much experimental work is being done at the Bureau of Standards in the direction of simplification of plumbing requirements.

I appointed a national committee in the matter of city zoning in response to the urgent request of many interested national associations with a view to development of larger vision and more uniform legislation upon this subject. The committee comprises:

Louis A. Moses, Cleveland,
Representing the Nat'l Association of Real Estate Boards.
J. Horace McFarland, Harrisburg, Pa.,
Representing the American Civic Association.
Nelson P. Lewis, New York
Representing the Nat'l Municipal League and the Nat'l City Planning Conference.
Lawrence Veiller, New York,
Representing The Nat'l Housing Association.
Morris Knowles, Pittsburgh,
of the United States Chamber of Commerce.
Edward M. Bassett, New York,
Chairman of the Zoning Committee of New York.
Frederick Law Olmstead, Brookline, Mass.
President of the Society of Landscape Architects.
John Ihlder, Washington,
of the United States Chamber of Commerce.

FINANCING HOME BUILDING

There is one problem that has distinctly national character and upon which national thought could be advanced by conference; that is, the mobilization of finance of home building. We have mobilized the commercial capital of the country through the Federal Reserve Banks; we have mobilized the farm mortgage capital through the Farm Loan Bureau; we are considering mobilizing production capital for the farmers through another organization. The country badly needs a mobilization of the home building capital based upon our building and loan associations, insurance companies and savings banks. We have a sound foundation upon which to build some sort of structure that would reduce the cost of home building capital, give it more mobility to all regions and afford greater security. A conference to consider this problem would be of great value.

$58,000,000 IN HOUSING CONSTRUCTION FINANCING

FIFTY-EIGHT million dollars has been loaned by the Metropolitan Life Insurance Company throughout the United States to build homes and apartments. The Chicago Trust Company, handling the loans for the Metropolitan Company in Illinois, Wisconsin and Northern Indiana, announces that in that territory $3,400,000 of the fund has been spread sufficiently to build 1040 homes and apartments, while new buildings are now going up at the rate of 30 a month. These houses have been erected in 66 cities.

The unusual part of the plan, according to the banking officials, is the small average of each loan, which is said to indicate that the construction is done for small home builders. The Illinois loans average about $4,000 each, which is approximately half the value of building and lot in each case. The builders are given 3 to 15 years in which to repay the loans.

The banking officials say that the Metropolitan Company does about as much clerical work in making one of these small loans as it would in putting out sixty million dollars in a few big loans, and that the large loan policy is the one usually favored by American companies with vast sums to invest. This is another reason why this large insurance company deserves great credit for placing such large sums in home building loans.

LABOR COST AND EFFICIENCY IN CARPENTER WORK

INTERESTING records that indicate the return of labor efficiency appear in the current issue of *Building Industry*, the official organ of The Builders' Exchange of Cleveland. The figures are taken from the original job records of R. E. Nixon, Cleveland contractor, and show the fluctuations in the cost of carpenter labor in the period 1914–1921 inclusive. To fully comprehend the reliability of the figures given it should be remembered that the houses erected are of identical size and finish, all built by Mr. Nixon and all located in the same general neighborhood in East Cleveland. The house is what might be termed a "stock" one, having a ground area 22 x 24, two stories in height, shingle roof, ordinary plumbing and hot air heating appliances. It contains 6 rooms and bath, the first floor being taken up by a living room, dining room and kitchen with 3 sleeping rooms and bath on the second floor. The figures given in the table cover the carpenter labor only, but it is interesting to note, from Mr. Nixon's statement, that the house complete was erected for about $2,300 in 1914 and 1915, the cost rising to approximately $6,100 in 1919 and receding to about $4,500, the figure it could be built for at the present time.

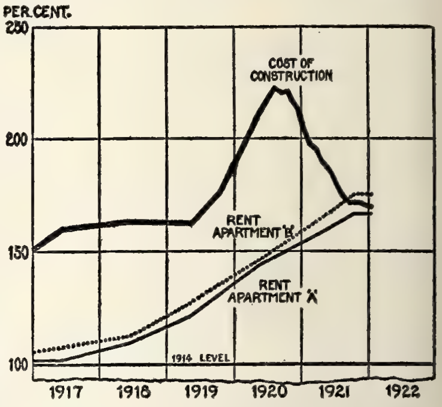
Because of war time restrictions on the building business, no houses of this type were constructed by Mr. Nixon during 1918.

Job No.	Year	Wage scale	Hours	Cost
14	1914	52½c.	656	344.40
19	1914	55	721	396.55
21	1914	55	629	345.95
28	1915	55	573	315.15
39	1915	55	492	270.60
40	1915	55	572	314.60
42	1915	55	463	264.65
43	1916	60	477	286.20
47	1916	60	584	350.40
48	1916	60	521	312.60
50	1916	60	612	367.20
52	1917	60	533	319.80
53	1917	60	557	334.20
54	1917	60	544	326.40
56	1917	60	591	354.60
59	1917	60	568	340.80
60	1917	70	512	358.40
61	1917	70	504	352.80
91	1919	80	687	549.60
93	1919	85	790	671.50
94	1919	85	926	787.10
96	1919	90	899	809.10
97	1919	90	1214	1092.60
121	1919	1.00	1108	1108.00
122	1920	1.00	1046	1046.00
123	1920	1.00	792	792.00
125	1920	1.00	775	775.00
130	1920	1.25	848	1060.00
133	1921	1.04	814	846.56
137	1921	1.04	673	699.92

APARTMENT RENTS AND CONSTRUCTION COSTS

A STUDY recently completed by the Federal Reserve Bank of New York shows that the rents paid by clerical and other workers receiving moderate sized salaries in New York are at present about 70 per cent higher than in 1914. Rents of the more expensive of the moderate priced apartments increased slightly more than those of the less expensive.

The accompanying diagram shows the changes in rents for two types of apartments, those renting for less than $15 per room in 1920, and those renting for between $15 and $30 per room in 1920. A third line in the diagram shows the changes which have taken place since 1917 in the cost of building construction in New York. Reductions in building costs during 1921 have brought that curve to about the same point as the index figures for rents. While there are other factors determining rents than construction costs, such as legal restrictions, interest rates and the availability of funds, taxes, and the shortage or surplus in the supply of dwellings, construction costs may be considered the major factor.



Apartment A Renting for Less than $15 per Room in 1920. Apartment B Renting for Between $15 and $30 per Room

The index figures shown for rents are averages of the percentage changes for typical buildings reported by 21 owners and operators of apartments. Rates of rental were calculated on the basis of continuous occupancy. The average index figures are given in the table at the foot of this page, together with other indices for changes in rents prepared by different agencies. The index numbers prepared by the United States Bureau of Labor Statistics and the National Industrial Conference Board are for buildings occupied by wage earners and are of a somewhat less expensive type than those included in the indices prepared by this bank.

The cost of construction index presented in the diagram is used through the courtesy of the George A. Fuller Co.

Labor costs entering into the index are computed on the basis of the pre-war efficiency of labor. If allowance were made for changes in efficiency the figures for 1920 would probably be higher, but no appreciable change would be made in the present level of the index, since the rate of output per man is now not far from the pre-war rate.

Apartment Rents and Construction Costs in New York City and the United States

(1914 = 100)

Index	1914	1915	1916	1917	1918	1919	1920	May 1921	Oct., 1921	Jan., 1922
RENTS:										
Federal Reserve Bank (apartments, type A, renting under $15 per room in 1920)	100	101	102	102	110	121	144	160	167	167
Federal Reserve Bank (apartments, type B, renting $15 to $30 per room in 1920)	100	101	102	107	112	127	145	166	175	175
U. S. Bureau of Labor Statistics (for New York City)	100	100	100	103	107	113	132	142	144	146*
U. S. Bureau of Labor Statistics (for U. S.)	100	102	102	100	109	114	135	159	160	161*
National Industrial Conference Board (for U. S.)	100	100	102	105	115	128	151	171	169	169
CONSTRUCTION COSTS (George A. Fuller Co., New York City)	100	112	143	164	168	168	230	193	177	173

*Dec. 1921.

Every man who knows the necessity of a protecting form for setting concrete knows the necessity of having Concrete Piles put in according to the Raymond method.

"A Form for Every Pile—A Pile for Every Purpose"

Raymond Concrete Pile Company
New York Chicago
140 Cedar Street 111 West Monroe Street
Canada, RAYMOND CONCRETE PILE CO., Ltd., Montreal
BRANCHES IN PRINCIPAL CITIES

RAYMOND

Selected List of Manufacturers' Literature

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, DECORATORS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to *The Architectural Forum*, 142 Berkeley St., Boston, Mass., or the manufacturer direct, in which case kindly mention this publication.

Listings in this Department are available to any manufacturer at the rate of $5 per listing per month.

ASBESTOS PRODUCTS

Asbestos Shingle, Slate & Sheathing Co., Ambler, Pa.

Ambler Asbestos Shingles. Catalog. 5½ x 8½ in. 40 pp. Illustrated.

Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 36 pp. Illustrated. Standard Purlin Spacing Tables.

Ambler Asbestos Corrugated Roofing and Siding. Catalog. 8½ x 11 in. 20 pp. Illustrated. Prices and specifications.

Ambler Asbestos Building Lumber. Catalog. 8½ x 11 in. 32 pp. Illustrated.

Engineers' Data Sheets. Catalog. 8½ x 11 in. 40 pp. Illustrated. Specifications and working sheets for Ambler Asbestos Corrugated Roofing and Siding.

ASH HOISTS—ELECTRIC AND HAND POWER

Gillis & Geoghegan, 544 West Broadway, New York, N. Y.

General Catalog. 8½ x 11 in. 20 pp. Fully illustrated. Contains specifications in two forms (with manufacturer's name and without). Detail ¼" scale for each telescopic model and special material-handling section.

The Man-Saving Load Lifter. 5⅞ x 8⅞ in. 8 pp. Illustrated. Describes G&G Telescopic and Non-Telescopic Hoists for handling material in factories.

BALANCES, SASH

Caldwell Mfg. Company, The, Rochester, N. Y.

Suggestion for the present-day Architect. Booklet. 6 x 9 in. 16 pp. Illustrated. Gives full-size dimensions and information for the purpose of writing specifications for Caldwell Sash Balances.

BOILERS—See Heating Equipment

BRICK

American Face Brick Association, 1151 Westminster Bldg., Chicago, Ill.

The Story of Brick. Booklet. 7 x 9¼ in. 55 pp. Illustrated. Presents the merits of face brick from structural and artistic standpoints. Tables of comparative costs.

The Home of Beauty. Booklet. 8 x 10 in. 72 pp. Color plates. Presents fifty designs for small face brick houses submitted in national competition by architects. Text by Aymar Embury II, Architect. Price 50c.

A Manual of Face-Brick Construction. Booklet. 8½ x 11 in. Textbook on construction of the brick wall and various uses of face brick. 31 colored plates of brick houses with plans. Price, $1.00

Common Brick Manufacturers Association of America, 1309 Schofield Bldg., Cleveland, Ohio.

Brick for the Average Man's Home. Book. 8½ x 11 in. 72 pp. Color plates. Book of plans for bungalows, houses and apartments for which working drawings are available. Price $1.00.

Brick—How to Build and Estimate. Book. 8½ x 11 in. 72 pp. Illustrated. A manual for the brick builder on estimating and details of brick construction. Price 25c.

BUILDING FINANCE

S. W. Straus & Co., 565 Fifth Ave., New York, N. Y.

The Straus Plan of Financing. Booklet. 8 x 6 in. 24 pp. Illustrated. Describes Straus system of co-operation with Architects, Builders, Engineers and Brokers in financing important building operations; also the making of construction loans on the larger and better properties in our large cities.

Forty Years Without Loss to Any Investor. Booklet. 8 x 5 in. 38 pp. Illustrated. A carefully prepared booklet for the thinking investor. Describes Straus bonds, the property upon which loans are made, and explains the Straus plan of safeguards which made possible the 40-year record.

BUILDING STONE—See Stone, Building

CEMENT

Atlas Portland Cement Company, 25 Broadway, New York, N. Y.

The Stucco House. Booklet. 8½ x 11 in. 96 pp. Illustrated. Contains valuable data on application of Portland Cement Stucco for those interested in building. Also photographic reproductions of beautiful and unusual stucco finishes, instructions and specifications.

Atlas Handbook on Concrete Construction. Book. 4¼ x 6½ in. 144 pp. Illustrated. Provides in convenient form practical information on concrete, plain and reinforced. Written from the practical rather than from the technical point of view. A valuable pocket text-book.

Carney's Cement Company, Mankato, Minn. Booklet. 8 x 10 in. 20 pp. Illustrated. Complete information on product, showing prominent buildings in which this cement has been used.

Sandusky Cement Co., Dept. F, Cleveland, Ohio.

Medusa White Portland Cement, Stainless. Booklet. 8½ x 11 in. 48 pp. Illustrated.

Medusa Waterproof White Portland Cement. Booklet 6 x 9 in. 32 pp. Illustrated.

Medusa Review. 6 x 9 in. 18 pp. Illustrated. House organ issued bi-monthly.

CONDUIT

National Metal Molding Co., 1113 Fulton Building, Pittsburgh, Pa.

Bulletin of all National Metal Molding Products In correspondence folder. 9½ x 11½ in.

Sherarduct. Circular. 5 x 8 in. Illustrated.

Flexsteel. Circular. 5 x 8 in. Illustrated.

CONSTRUCTION, FIREPROOF

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.

Standard Fire Proofing Bulletin 171. 8½ x 11 in. 32 pp. Illustrated A treatise on fire proof floor construction.

CONSTRUCTION, FIREPROOF — Continued

Northwestern Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.

Fireproof Construction. Catalog. 6 x 9 in. 72 pp. Illustrated. Handbook of practical suggestions for architects and contractors. Describing Nemco Expanded Metal Lath.

Fire-proof Construction. Handbook. 6 x 9 in. 72 pp. Illustrated. Describing Kno-Burn expanded metal lath.

United States Gypsum Company, 205 West Monroe St., Chicago, Ill.

Pyrobar Gypsum Tile. Booklet. 8½ x 11 in. 32 pp. Illustrated. Details and specifications for fireproof partitions.

Bulletins, 8½ x 11 in., containing details and specifications for Pyrobar voids for use with reinforced concrete joist floor construction; Pyrobar roof tile; and monolithic gypsum floors and roofs.

DAMPPROOFING

The Truscon Laboratories, Detroit, Mich.

Booklet. 5⅛ x 7¾ in. Illustrated. Contains descriptions and specifications of black dampproofing compounds for interior and exterior use.

DECORATIVE FABRICS

M. H. Rogers, Inc., 912 Broadway, New York, N. Y.

Samples of the following materials will be sent to architects upon request, to meet specific requirements:

Tapestries, velours, damasks, armures, cretonnes, tapestry panels, needlepoints, chair and sofa seats and backs.

DOORS, WINDOWS AND TRIM, METAL

Dahlstrom Metallic Door Company, 425 Buffalo Street, Jamestown, N. Y.

Architectural Catalog. 10 x 14 in. 46 pp. 11 sections. Illustrated. Catalog showing our regular styles and types of hollow metal doors and interior trim. Various types of frames and other architectural shapes also illustrated.

Architectural Portfolio. 14 x 18 in. 30 pp. Illustrated. Portfolio of various designs and types of Dahlstrom doors. Drawings and details of each style or type. This is only sent free to reliable architects.

The Compound & Pyrono Door Company, St. Joseph, Mich.

Pyrono Handbook for Architects and Contractors. 8½ x 11 in. 16 pp. Contains full information regarding Pyrono Fireproof Veneered Doors and Trim, with complete details and specifications.

Pyrono details in sheet form for tracing.

The G. Drouvé Company, Bridgeport, Conn.

Daylighting the Factory. Booklet. 8½ x 11 in. 26 pp. Illustrated. Describes and illustrates the "Anti-Pluvius" puttyless skylight construction. Also contains interesting information on how to judge a skylight and the advantages of skylighting industrial plants.

DUMBWAITERS

Kaestner & Hecht Co., Chicago, Ill.

Bulletin 520. Describes K. & H. Co. electric dumbwaiters. 8 pp.

Sedgwick Machine Works, 151 West 15th Street, New York.

Catalog and Service Sheets. Standard specifications, plans and prices for various types, etc. 4¼ x 8¼ in. 60 pp. Illustrated.

ELECTRICAL EQUIPMENT

Frink, I. P., Inc., 24th Street and 10th Avenue, New York, N. Y.

Catalog 415. 3½ x 11 in. 46 pp. Photographs and scaled cross sections. Specialized bank lighting, screen and partition reflectors, double and single desk reflectors and Polaralite Signs.

Kohler Co., Kohler, Wis.

Kohler Automatic Power and Light 110 Volt D. C. Booklet. 5 x 7 in. 32 pp. Illustrated. Describes a standard voltage automatic, electric power and light plant for isolated homes.

Simplex Wire & Cable Co., 201 Devonshire Street, Boston, Mass.

Simplex Manual Catalog and reference book. 6¾ x 4¼ in. 92 pp. Contains in addition to information regarding Simplex products, tables and data for the ready reference of architects, electrical engineers and contractors.

Smyser-Royer Co., 1609 Sansom St., Philadelphia, Pa.

Exterior Lighting Fixtures. Catalog F. 8½ x 11½ in. Illustrated. Illustrates lamp standards, brackets, lanterns and pier lights, for exterior use.

Sprague Electric Works of the General Electric Company, 527 West 34th St., New York, N. Y.

Panel Boards and Cabinets. Catalog No. 47901. 8 x 10½ in. 70 pp. Illustrated. Panel Boards and Cabinets shown in this catalog have been selected after careful study of the general requirements. All appliances listed herein meet with the requirements of the National Board of Fire Underwriters.

Panel Circuits. Bulletin No. 47941. 8 x 10½ in. 8 pp. Illustrated. In addition to circuits for panel boards illustrated, a full line of circuits for panel boards having fuses inside branch circuit switches is also listed.

Panel Boards and Cabinets. Bulletin No. 47942. 8 x 10½ in. 16 pp. Illustrated. This bulletin covers the ever increasing demand for devices that provide maximum safety to the operator.

Dead Front Panels. Pamphlet No. 727. 5¼ x 7¾ in. 8 pp. Illustrated. A "Safety First" pamphlet covering Safety Panels and Dead Front Switchboards, for use in office buildings, factories, theaters, department stores, public buildings and in all places where the switches may be operated by persons ignorant of the changes of contact with current-carrying parts.

B. F. Sturtevant Company, Inc., Hyde Park, Boston, Mass.

Catalog No. 264. 8¼ x 10⅞ in. 54 pp. Illustrated. Gives description with diagrams of various types of motors, generators, generating sets, propeller fans, air heaters, and apparatus for special application.

The Lesson *of the* Rust-Stained Bowl

EVERY plumber knows that hot water and even cold water rusts pipes. Rust stains wash-bowls, sinks, and bathtubs. It ruins fabrics. Sooner or later the rusted pipes must be torn out at great expense. Pavements must be taken up and walls opened at a cost that may run into the thousands.

There is one safe way of avoiding corrosion and its consequences:

Use correctly annealed brass pipe, especially for hot-water lines, and for all concealed and buried work. Such pipe will last for decades.

ANACONDA semi-annealed, seamless brass pipe made by The American Brass Company resists corrosion. The process by which it is manufactured was developed as a result of fifty years' experience.

ANACONDA semi-annealed brass pipe is guaranteed not to split.

The slightly higher cost of installing brass pipe more than offsets the far greater expense that must be sooner or later incurred in tearing out pipe that has rusted or clogged and in repairing the damage that rust has caused.

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from mine to consumer
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WATERBURY, CONN. U. S.A.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 68*

ELEVATORS

Kaestner & Hecht Co., Chicago, Ill.

Bulletin 500. Contains 32 pp. Giving general information on passenger elevators for high buildings.

Otis Elevator Company, 11th Ave. & 26th Street, New York, N. Y.

Otis Push Button Controlled Elevators. Booklet. 6 x 9 in. 56 pp. Illustrated. Detailed description of Otis Push Button Elevators. Their uses in residences, stores, institutions, apartment houses, business offices and banks, etc.

Otis Gravity Spiral Conveyors. Booklet. 6 x 9 in. 56 pp. Illustrated. Gravity spiral conveyors for lowering packaged merchandise, boxed, cased and bundled goods in factories, warehouses, terminal buildings, etc.

Otis Electric Traction Elevators. Booklet. 9 x 12 in. 28 pp. Illustrated. Full details and illustrations of Otis geared and gearless traction elevators for all types of buildings.

Otis Escalators. Booklet. 6 x 9 in. 36 pp. Illustrated. Description of step and cleat type single and double file escalators (moving stairways).

Sedgwick Machine Works, 151 West 15th Street, New York.

Catalog and descriptive pamphlets. 4¼ x 8¼ in. 70 pp. Illustrated. Descriptive pamphlets on hand power freight elevators, sidewalk elevators, automobile elevators, etc.

FENCES

American Fence Construction Co., 130 West 34th St., New York.

Afco Factory Fences. Booklet. 9 x 12 in. 32 pp. Illustrated.

Residential Fences. Booklets. 7 x 2½ in. Illustrated. A series of booklets on residential fences consisting of photographs and brief descriptions.

The J. W. Fiske Iron Works, 78 Park Place, New York, N. Y.

Fences. Booklet. 8 x 10 in. 64 pp. Illustrated. Devoted to wrought iron railings, entrance gates and wire fencing.

Garden Furniture. Booklet. 7 x 10 in. 46 pp. Illustrated. Describes and illustrates ornamental iron settees, chairs, etc.

FIRE DOORS —See Doors, Windows and Trim, Metal

FIREPLACE EQUIPMENT

Covert Co., H. W., 137 E. 46th Street, New York, N. Y.

Hints on Fireplace Construction. Catalog. 5⅝ x 8½ in. 11 pp. Illustrated. Diagrams of construction and installation of Covert "Improved" and "Old Style" Dampers and Smoke Chambers. Also illustrations of Covert brass and wrought iron Fireplace Fittings.

FLOORING

Armstrong Cork & Insulation Co., 132 24th Street, Pittsburgh, Pa.

Linotile Floors. Catalog. 6 x 9 in. 40 pp. Color plates. Describes Linotile, a composition of ground cork, wood flour, linseed oil and various gums and pigments in tile form.

Armstrong's Cork Tile. Booklet 5 x 7 in. 16 pp. Illustrated in color.

Armstrong Cork Co. (Linoleum Dept.), Lancaster, Pa.

Armstrong's Linoleum Floors. Catalog. 8½ x 11 in. 54 pp. Color plates. A technical treatise on linoleum, including table of gauges and weights and specifications for installing linoleum floors.

Decorative Floors Booklet. 11¼ x 15 in. 16 pp. Color plates

Armstrong's Linoleum Pattern Book, 1922. Catalog. 3½ x 6 in. 168 pp. Color plates. Reproductions in color of all patterns of linoleum and cork carpet in the Armstrong line.

Quality Sample Book. Three books. 3½ x 5¾ in. Showing all gauges and thicknesses in the Armstrong line of linoleum and cork carpets.

Carter Bloxonend Flooring Co., 1303 R. A. Long Bldg., Kansas City, Mo.

Blox-on-end Flooring. Catalog. 3¼ x 6¼ in. 20 pp. Illustrated. Describing Blox-on-end Flooring and its adaptability to concrete, wood or steel construction; also various methods of installation.

Specification Sheet. 8½ x 11 in. 4 pp. Illustrated. Standard specifications in convenient form for architects and engineers as recommended by the American Institute of Architects.

Congoleum Company, Inc. (Linoleum Dept.), Philadelphia, Pa.

"Specifications for Laying Linoleum and Cork Carpet, according to the Congoleum Company's new method compiled after years of careful research."

Linoleum Service Sheet. Gives complete printed specifications as well as detail drawings showing application in specific cases such as thresholds, staircases, under radiators, etc.

Installation and Care of Battleship Linoleum. Booklet. 6 x 9 in. 24 pp. Illustrated. Instructions as to the uses of Battleship Linoleum, its laying and care.

Pocket Pattern Book. Descriptive Booklet. 3½ x 8½ in. 64 pp. Illustrated. Shows color reproductions of every grade and color of Gold Seal Battleship Linoleum, Inlaid Linoleum, Cork Carpet and also all patterns of the Gold-Seal Line.

The Marbleloid Co., 461 Eighth Ave., New York, N. Y.

The Universal Flooring for Modern Buildings. Booklet. 6¾ x 9¾ in. 32 pp. Illustrated. Describes uses and contains specifications for Marbleloid flooring, base, wainscoting, etc.

Marbleloid Flooring for Hospitals. Bulletin. 8½ x 11 in. 4 pp. Illustrated. Describes the especial features of this composition floor for hospital buildings.

Marbleloid Specifications. Booklet. 8½ x 11 in. 4 pp. Illustrated.

Muller Co., Franklyn R., Waukegan, Ill.

Asbestone Composition Flooring. Circulars. 8½ x 11 in. Description and Specifications.

Oak Flooring Manufacturers Association, 1014 Ashland Block, Chicago, Ill.

Modern Oak Floors. Booklet. 6⅛ x 9¼ in. 24 pp. Illustrated. A general book that tells the complete story on Oak Flooring.

Oak Flooring, How and When to Use it. Booklet. 3½ x 6¼ in. 16 pp. Illustrated. A small, technical book showing the general rules, standard thickness and widths, how to lay, finish and care for oak floors.

FLOOR HARDENERS

General Chemical Company, The, 25 Broad Street, New York, N. Y.

Making Concrete Wear Like Iron. Booklet. 4 pp. 8½ x 11 in. Illustrated. Describes Hard-n-tyte and its application to concrete floors.

Casehardening Concrete. Folder. 3¾ x 8½ in. 6 pp. Illustrated. Describes treatment of concrete surfaces with Hard-n-tyte so that they become literally "casehardened."

FLOOR HARDENERS — Continued

General Chemical Company, The — Continued

The Hard-n-tyte Specification. Booklet. 8½ x 11 in. 4 pp. Gives exact specifications for concrete floor finish.

Sonneborn Sons, Inc., L., 266 Pearl Street, New York.

Concrete and Lapidolith. Booklet. 5⅝ x 8⅛ in. 24 pp. Illustrated. Describing relation of Lapidolith chemical floor hardener to concrete construction.

Why Lapidolize? Booklet. 8½ x 11 in. 11 pp. Illustrated. Reasons why Lapidolith should be specified.

Lapidolith Specifications. Circular. 8½ x 10¾ in. 2 pp.

FLOOR HARDENERS (CHEMICAL)

The Truscon Laboratories, Detroit, Mich.

Agatex and Its Performances. Booklet. 8½ x 11 in. 16 pp. Describes use of Agatex Liquid Chemical for hardening cement floors.

FLOOR HARDENERS (METALLIC)

The Truscon Laboratories, Detroit, Mich.

Truscon Floor Hardener. Pamphlet. 7¾ x 5½ in. 18 pp.

FURNACES—See Heating Equipment

FURNITURE

Estey Organ Company, Brattleboro, Vt.

Pipe Organs. Complete specifications and full information furnished to the architect for pipe organ to be installed in any given residence, upon receipt of plans and other particulars.

Hampton Shops, 18 East 50th St., New York, N. Y.

Glimpses from Hampton Exhibits. Brochure. 16 pp. 5 x 7½ in. Illustrated. Shows examples of Hampton work and gives one an idea of their resources. Of interest to the client as well as to the architect.

Kensington Mfg. Company, 14 East 32nd St., New York, N. Y.

Photographs and full description of hand-made furniture in all the period styles furnished promptly in response to a specific inquiry.

Illustrated booklet indicative of the scope, character and decorative quality of Kensington furniture mailed on request.

Kewaunee Mfg. Company, Kewaunee, Wis.

Book No. 13. 6 x 9 in. 194 pp. Illustrated. Full description of Kewaunee Vocational Equipment for domestic science, demonstration dining rooms, fitting rooms, drafting rooms, manual training and shop-equipment, kindergarten and hospital equipment and dietetic tables.

Book No. 14. 6 x 9 in. 226 pp. Illustrated. Shows Laboratory furniture for chemistry, physics, biology, zoology, electrical and physiography laboratories, medical college, hospital laboratory equipment, industrial and commercial laboratory equipment. Engineering service gratis.

Elgin A. Simonds Company, Syracuse, N. Y.

Furnishing the Home. 24 pp. 6 x 9 in. Illustrated. A treatise on modern interior decoration.

GLASS CONSTRUCTION

Mississippi Wire Glass, 220 Fifth Avenue, New York.

Mississippi Wire Glass. Catalog. 3⅞ x 8½ in. 32 pp Illustrated. Covers the complete line.

GRANITE—See Stone, Building

HARDWARE

Cutler Mail Chute Company, Rochester, N. Y.

Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

McKinney Mfg. Co., Pittsburgh, Pa.

McKinney Cabinet Hardware. Catalog. 6 x 9 in. 32 pp. Illustrated. Describes complete line of hardware for cabinet and furniture work.

McKinney Hardware for Sliding Doors. Booklet. 6 x 9 in. 18 pp. Illustrated. Describes different types of sliding door hardware.

Stanley Works, The, New Britain, Conn.

Wrought Hardware. Catalog. BJ10. 6½ x 10 in. Color plates. Shows all of the Stanley Works products made of steel from their own mills.

Eight Garages and their Stanley Garage Hardware. Booklet. 5 x 6¾ in. 32 pp. Illustrated. Illustrations and floor plans of eight typical garages that have been correctly equipped with Stanley Garage Hardware.

Ball Bearing Butts. Booklet. B8. 5 x 7¼ in. 32 pp. Illustrated. Concise description of various butts manufactured.

Stanley Specially Designed Garage Hardware. Booklet. B-50. 6 x 9 in. 24 pp. Illustrated. Detailed pictures and descriptions of various garage hardware equipment.

Vonnegut Hardware Co., Indianapolis, Ind.

Von Duprin Self-Releasing Fire Exit Devices. Catalog. 12F 8 x 11 in. 41 pp. Illustrated.

"Saving Lives." Booklet. 3¼ x 6 in. 16 pp. Illustrated. A brief outline why Self-Releasing Fire Exit Devices should be used.

HEATING EQUIPMENT

American District Steam Company, North Tonawanda, N. Y.

Bulletin No. 150-AF. 6 x 9 in. 32 pp. Illustrated. Describes the Adsco System of Atmospheric Steam Heating and explains how it saves 20 to 30% of fuel cost. Tells how to figure radiation.

Catalog No. 21-AF. 6 x 9 in. 200 pp. Illustrated. Lists and describes the full line of equipment and devices manufactured for use on underground and interior steam mains, expansion joints, steam meters, condensation meters, traps, flange fittings, angle fittings, manhole curbs, alignment guides, etc.

Clarage Fan Company, Kalamazoo, Mich.

Catalog No. 52. 8½ x 11 in. 84 pp. Illustrated. Describes Clarage Kalamazoo Multiblade Fans and Heaters for use in schools, churches, hospitals and industrial plants. Engineering data, capacity tables and dimensions included.

James B. Clow & Sons, 534 S. Franklin Street, Chicago, Ill.

Gasteam. Catalog. 6 x 9 in. 16 pp. Illustrated. New radiator using gas for fuel.

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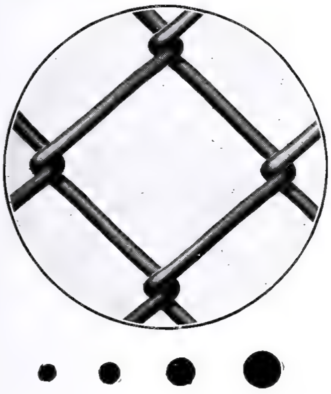

Section of Page - Protection Fence showing actual sizes of wire used.

PAGE-PROTECTION Fence controls the admission and exit of persons, merchandise, automobiles, railroad siding deliveries and shipments and is a strong guard against loss through theft, property damage and trespassing.

Page-Protection Fence always gives satisfaction. It has the rugged strength to resist its most formidable foes—wind and weather and trespasser.

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PAGE PROTECTION FENCE

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 70*

HEATING EQUIPMENT — Continued

Excelso Specialty Works, 119 Clinton St., Buffalo, N. Y.

Excelso Water Heater. Booklet. 12 pp. 3 x 6 in. Illustrated. Describing the new Excelso method of generating domestic hot water in connection with heating boilers. (Firepot Coil eliminated.)

Gorton & Lidgerwood Co., 96 Liberty Street, New York, N. Y.

Gorton Self-Feeding Boilers. Booklet. 4¼ x 7¼ in. 32 pp. Illustrated. Descriptions, specifications and prices.

Johnson Service Company, 149 Michigan St., Milwaukee, Wis.

Regulation of Temperature and Humidity. Booklet. 11¼ x 8½ in. 64 pp. Illustrated. Describes Johnson system of pneumatic, automatic regulation of temperature and humidity, and illustrates thermostats, valves, air compressors, dampers and other parts.

Johnson Electric Thermostats, Valves and Controllers. Booklet. 6⅛ x 3½ in. 24 pp. Illustrated. Excellent plates showing electric thermostats and controllers.

Kelsey Heating Company, James St., Syracuse, N. Y.

Booklet No. 5. 4 x 9 in. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended, and shows the mechanical and gravity system of heating homes, churches and schools.

Monroe Pipeless Booklet. 4½ x 8 in. 20 pp. Illustrated.

Monroe Tubular Heater. Booklet. 4½ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.

Syracuse Pipeless Booklet. 4½ x 8 in. 12 pp. Illustrated. General Booklet, giving sizes and capacities.

Kewanee Boiler Co., Kewanee, Ill.

Kewanee on the Job. Catalog. 8½ x 11 in. 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators, etc.

Catalog No. 73. 6 x 9 in. 35 pp. Illustrated. Describes Kewanee steel power boilers with complete specifications.

Minneapolis Heat Regulator Company, Minneapolis, Minn.

The Heart of the Heating Plant. Catalog. 6 x 9 in. 20 pp. Illustrated. Describing the Minneapolis Heat Regulator, its construction, application and operation for the automatic control of temperature where coal, gas, fuel oil or street steam is used.

Page Boiler Company, The Wm. H., 141 West 36th Street, New York, N. Y

Page Boilers. Catalog. 4½ x 8 in. 84 pp. Illustrated. Descriptions with specifications of the Volunteer Round and Monarch Square Sectional Boilers; also the Monarch Up-Draft and Down-Draft Smokeless Boiler; with method for apportioning size of boiler and radiation, and other heating data.

Smith Co., H. B., 57 Main Street, Westfield, Mass.

General Boiler and Radiator Catalog. 4 x 7 in. 90 pp. Illustrated. Giving ratings, dimensions, capacities and working pressures.

Engineer's Data Ring Book. 4 x 7 in. 125 pp. Illustrated.

Architect's and Contractor's Binders. These binders are made up of 9½ x 11 in. folders of different kinds giving dimensions, price lists, and erecting directions on the different lines of our manufacture.

B. F. Sturtevant Company, Inc., Hyde Park, Boston, Mass.

Catalog No. 230. 8¼ x 10⅞ in. 132 pp. Illustrated. Gives description and data tables of various types of heaters, also of steam traps.

Bulletin No. 227. 8⅜ x 10 11/16 in. 28 pp. Blue prints of heating and ventilating layouts in public buildings, factories, etc.

Catalog No. 1015. Book on Heating and Ventilating, complete with installations and diagrams.

United States Radiator Corporation, Detroit, Mich.

The Complete Line. Catalog. 4¼ x 7¼ in. 255 pp. Illustrated. Contains important technical information of special interest to architects and heating engineers.

Capitol Smokeless Type Boilers. Booklet. 8½ x 11 in. 12 pp. Illustrated. Describing a new type of low-pressure heating boiler which burns soft coal without smoke.

Warren Webster & Co., Camden, N. J.

Webster Vacuum System of Steam Heating. Catalog. 8 x 10½ in. 36 pp. Illustrated. Describing the Webster Vacuum System of Steam Heating, its principles of operation, and advantages of installation.

Webster Feed-Water Heaters. Catalog. 8 x 10½ in. 28 pp. Illustrated. Describing the construction and operation of the Webster Feed-Water Heaters for steam-heating systems, power plants and industrial plants of every type.

HEAT REGULATORS—See Heating Equipment

HOISTS

Gillis & Geoghegan, 544 West Broadway, New York

Hoists for Industrial Plants. Booklet. 6 x 8¾ in. 8 pp. Illustrated. Labor saving service in the lifting or lowering of lighter loads, through the use of G. & G. Telescopic and Non-telescopic Hoists.

Removing Ashes. Booklet. 6 x 8¾ in. 6 pp. Illustrated. Removing ashes from boiler room directly to wagon by electrically operated Telescopic Hoists.

HOLLOW TILE—See Tile, Hollow

INSULATION

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio.

For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base.

Philip Carey Co., The, Cincinnati, Ohio.

Carey Asbestos and Magnesia Products. Catalog. 6 x 9 in. 72 pp. Illustrated

United States Gypsum Company, 205 West Monroe St., Chicago, Ill.

Bulletin, 8½ x 11 in. Details and specifications for insulating roofs to prevent condensation.

INTERIOR DECORATION

Arthur Todhunter, 414 Madison Ave., New York, N. Y.

Mantels and Fireplace Equipment. Booklet. 8½ x 11 in. Illustrated. Separate sheet plates showing mantels installed and furnished, also andirons and grates grouped with suitable pieces, also lanterns, weather-vanes and hand-wrought hardware. All sizes and descriptions given on each plate.

LATH, METAL AND REINFORCING

North Western Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.

Designing Data. Catalog. 6 x 9 in. 94 pp. Illustrated. Describes most efficient use of Econo Expanded Metal Reinforcing.

Formless Concrete Construction. Catalog. 6 x 9 in. 80 pp. Illustrated. Describes use of T-Rib Chanelath, a form and reinforcing for concrete.

LIGHTING SYSTEMS

The J. G. Wilson Corporation, 11 East 36th St., New York, N. Y.

Diffuselite System of Lighting. A number of leaflets and folders covering Diffuselite Paints, Blinds and Fixtures.

LUMBER

Morgan Millwork Organization, Chicago, Ill.

Building With Assurance. Book. 8½ x 11 in. 408 pp. Illustrated. Valuable to architects for the Standardized Mill Work illustrated and described.

Price Supplement. Catalog. 4 x 8 in. 96 pp. Illustrated. Prices all illustrations in "Building With Assurance" and is valuable in connection with it or by itself.

MAIL CHUTES

Cutler Mail Chute Company, Rochester, N. Y.

Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

MARBLE

The Georgia Marble Company, Tate, Ga. New York office, 1328 Broadway.

Why Georgia Marble is Better. Booklet. 3⅜ x 6 in. Gives analysis, physical qualities, comparison of absorption with granites, opinions of authorities, etc.

Convincing Proof. Booklet. 3⅜ x 6 in. 8 pp. Classified list of buildings and memorials in which Georgia Marble has been used, with names of Architects and Sculptors.

METAL LATH—See Lath, Metal and Reinforcing

METALS

American Brass Company, Waterbury, Conn.

Illustrated pamphlet describes the use and adaptability of extruded architectural shapes to meet the architect's design.

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.

Reference Book. Pocket Ed. 2½ x 4½ in. 168 pp. Illustrated. Covers the complete line of Sheet and Tin Mill Products.

Apollo and Apollo-Keystone Galvanized Sheets. Catalog. 8½ x 11 in. 20 pp. Illustrated.

Research on the Corrosion Resistance of Copper Steel. Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.

Facts Simply and Briefly Told. Booklet. 8½ x 11 in. 16 pp Illustrated. Non-technical statements relating to Keystone Copper Steel.

Black Sheets and Special Sheets. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes standard grades of Black and Uncoated Sheets, together with weights, bundling tables, etc.

Bright Tin Plates. Catalog. 8½ x 11 in. 16 pp.

Rome Brass & Copper Company, Rome, N. Y.

Descriptive Price List. 5 x 7 in. A leather-covered loose-leaf book listing sheets, tubes, rods, rolls, anodes, strips, extruded shapes, angles and channels, tapered tubes and hose pipes; molding, door-rail; commutator bars and segments; electrical copper bar, rivets and burs.

METAL TRIM—See Doors, Windows and Trim, Metal

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.

Clinton Mortar Colors. Booklet. 3½ x 6⅝ in. 8 pp. Illustrated. Complete description of Clinton Mortar Colors with color samples.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Boston Varnish Co., Everett Station, Boston, Mass.

The Inviting Home. Booklet. 5½ x 9 in. 16 pp. Color Plates. A briefly worded book on painting for the busy architect or decorator.

Cabot, Inc., Samuel, Boston, Mass.

Cabot's Creosote Stains. Booklet. 4 x 8½ in. 16 pp. Illustrated.

Fox Co., M. Ewing, New York, N. Y.

Calcimines. Booklet. 3¼ x 6¼ in. 8 pp. Color cards.

S. C. Johnson & Son, Racine, Wis.

The Proper Treatment for Floors, Woodwork & Furniture. Booklet. 6¼ x 8⅜ in. 32 pp. Illustrated in color. A treatise on finishing hard and soft wood in stained and enameled effects; also natural wood effects.

Portfolio of Wood Panels. 5½ x 10¾ in. 14 pp. A portfolio containing actual panels of finished woods. Also contains valuable information on finishing and re-finishing floors and woodwork.

National Lead Company, 111 Broadway, New York, N. Y.

Handy Book on Painting. Book. 5½ x 3¼ in. 100 pp. Gives directions and formulas for painting various surfaces of wood, plaster, metal, etc., both interior and exterior.

Red Lead in Paste Form. Booklet. 6¼ x 3½ in. 16 pp. Illustrated. Directions and formulas for painting metals.

Came Lead. Booklet. 8¾ x 6 in. 12 pp. Illustrated. Describes various styles of lead cames.

Cinch Anchoring Specialties. Booklet. 6 x 3½ in. 20 pp. Illustrated. Describes complete line of expansion bolts.

O'Brien Varnish Co., 2100 Washington Avenue, South Bend, Ind.

That Magic Thing Called Color. Booklet. 5½ x 8½ in. 24 pp. Illustrated. Short preface on the use of color in the home, special reference to walls and ceilings.

Architects' Portfolio. 8½ x 11 in. 50 pp. Illustrated. Complete information on all paint and varnish products, together with complete specifications for the use of Liquid Velvet Flat Wall Enamel.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 72*

PAINTS, STAINS, VARNISHES AND WOOD FINISHES — Continued

The Ripolin Company, Cleveland, Ohio

Ripolin Specification Book. 8 x 10¼ in. 12 pp. Complete specifications and general instructions for the application of Ripolin, the original Holland enamel paint. Also directions for proper finishing of wood, metal, plaster, concrete, brick and other surfaces.

Ruberoid Co., The (formerly the Standard Paint Co.), 95 Madison Avenue, New York, N. Y.

Preservative Coatings. Booklet. 6 x 9 in. 15 pp. Illustrated Presents in a concise manner the properties and uses of the Ruberoid Company's various paint preparations.

Smith & Co., Edward, P. O. Box 76, City Hall Station, New York, N. Y.

Architect's Hand Book. 4¾ x 7½ in. 24 pp. Specifications and suggestions for painting, varnishing, enameling, etc.

Sonneborn Sons, Inc., L., Dept. 4, 264 Pearl Street, New York.

Paint Specifications. Booklet. 8½ x 10¾ in. 4 pp.

The Truscon Laboratories, Detroit, Mich.

Architects' Specification Handbook. 8½ x 11 in. 34 pp. Complete specifications covering Waterproofings, Dampproofings, Oilproofings, Technical Finishes, Steel Paints and Varnishes.

PARTITIONS

Improved Office Partition Company, 25 Grant St., Elmhurst, L. I.

Telesco Partition. Catalog. 8¼ x 11 in. 14 pp. Illustrated. Shows typical offices laid out with Telesco partitions, cuts of finished partition units in various woods. Gives specifications and cuts of buildings using Telesco.

Detailed Instructions for erecting Telesco Partitions. Booklet. 24 pp. 8½ x 11 in. Illustrated. Complete instructions, with cuts and drawings, showing how easily Telesco Partition can be erected.

The J. G. Wilson Corporation, 11 East 36th St., New York, N. Y.

Folding Partitions. Booklet. 8½ x 11½ in 16 pp. Illustrated. Covers the field of folding partitions for churches, schools, hotels, clubs and public institutions.

Rolling Partitions, Hygienic and Disappearing Door Wardrobes. Booklet. 6 x 9 in. 32 pp. Illustrated. Describes rolling partitions, particularly in churches and schools, and wardrobes as installed in schools and public institutions.

PIPE

American Brass Company, Waterbury, Conn.

Illustrated pamphlet giving tables of weights and price-lists devoted to Brass and Copper Pipe in iron pipe and plumbers' sizes.

Clow & Sons, James B., 534 S. Franklin Street, Chicago, Ill.

Catalog "A." 4 x 6½ in. 706 pp. Illustrated. Shows a full line of steam, gas and water works supplies.

National Tube Co., Frick Building, Pittsburgh, Pa.

National Bulletin No. 11, History, Characteristics and Advantages of National Pipe. Catalog. 8½ x 11 in. 48 pp. Illustrated.

PLUMBING EQUIPMENT

American Brass Company, Waterbury, Conn

Benedict Nickel. Illustrated pamphlet descriptive of Benedict Nickel White Metal for high-grade plumbing fixtures.

A. P. W. Paper Company, Albany, N. Y.

The Onliwon Cabinet and Paper. Booklet. 5⅞ x 3⅜ in. 24 pp. Illustrated. Contains descriptions, illustrations and specifications of cabinets for serving Onliwon toilet paper and Onliwon paper towels.

Brunswick-Balke-Collender Co., 623 S. Wabash Avenue, Chicago, Ill.

Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 4 pp. Illustrated.

Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 8 pp. Illustrated.

Clow & Sons, James B., 534 S. Franklin Street, Chicago, Ill.

Catalog "M." 9¼ x 12 in. 184 pp. Illustrated. Shows complete line of plumbing fixtures for Schools, Railroads and Industrial Plants.

Crane Company, 836 S. Michigan Avenue, Chicago, Ill.

Crane Products in World Wide Use. Catalog. 5 x 9½ in. 24 pp. Illustrated.

Plumbing Suggestions for Home Builders. Catalog. 3 x 6 in. 80 pp. Illustrated.

Plumbing Suggestions for Industrial Plants. Catalog. 4 x 6½ in. 43 pp. Illustrated.

Kohler Co., Kohler, Wis.

Kohler of Kohler. 5½ x 8 in. 48 pp. Illustrated catalog. Shows complete line of plumbing fixtures.

Maddock's Sons Co., Thomas, Trenton, N. J.

Highest Grade Standardized Plumbing Fixtures for Every Need. Catalog. 5 x 7½ in. 94 pp. Illustrated. Covers the complete line.

Bathroom Individuality. Booklet. 6 x 9 in. 28 pp. Illustrated. Showing view of complete bathrooms with complete descriptions of floor plans.

Specifications for plumbing fixtures. Booklet. 9 x 12 in. 8 pp. Tables of specifications for industrial buildings, schools, apartments, hotels, etc.

Speakman Company, Wilmington, Del.

Speakman Showers and Fixtures. Catalog. 4½ x 7½ in. 250 pp. Illustrated. Catalog of Modern Showers and Brass Plumbing Fixtures, with drawings showing layouts, measurements, etc.

Toned Up In Ten Minutes. Booklet. 7½ x 10½ in. 16 pp. Illustrated. Modern Showers and Washups for Industrial Plants, showing the sanitary method of washing in running water.

Wolff Manufacturing Company, 255 No. Hoyne Ave., Chicago, Ill.

Plumbing Suggestions Catalog. 3¼ x 6 in. 50 pp Illustrated. Illustrating, describing and pricing Wolff Quality Plumbing Fixtures for residential installation.

PUMPS

Goulds Mfg. Co., The, Seneca Falls, N. Y.

Set of Twenty Bulletins. 7½ x 10⅝ in. 12 to 32 pp. each. Illustrated. Covers complete line of power and centrifugal pumps for all services.

Catalog "K." 6 x 9 in. 216 pp. Illustrated. Covers complete line of smaller size pumps.

REFRIGERATION

Jewett Refrigerator Company, 138 Chandler St., Buffalo, N. Y.

Refrigeration and Health — Vital Facts You Ought to Know. Booklet. 4¾ x 7¾ in. 16 pp. Illustrated. Booklet outlining the basic requirements of a good refrigerator and explaining how to use a refrigerator to obtain best results.

ROLLING DOORS AND SHUTTERS

The J. G. Wilson Corporation, 8 West 40th St., New York, N. Y.

Rolling Doors and Shutters—Steel and Wood. Catalog. 8½ x 11½ in. 80 pp. Illustrated. For engineers and architects. Covers all classes of heavy doors, for every purpose, and in great variety of materials, bronze, steel and wood. Many sheets of detail drawings.

ROOFING

American Brass Company, Waterbury, Conn.

Copper Products for Roofing Purposes. Illustrated price-list devoted to copper products, including sheets and rolls, for fabricating into leaders, gutters, flashings, shingles, etc.

American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.

Better Buildings. Catalog. 8½ x 11 in. 32 pp. Describes Corrugated and Formed Sheet Steel Roofing and Siding Products, black, painted and galvanized, with directions for application of various patterns of Sheet Steel Roofing in various types of construction.

Copper—Its Effect Upon Steel for Roofing Tin. Catalog 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high grade roofing tin plates and the advantages of the copper-steel alloy.

Philip Carey Co., The, Cincinnati, Ohio.

Architects Specifications for Carey Building Material. 8½ x 11 in. 48 pp. Illustrated.

Creo-Dipt Company, 1025 Oliver St., North Tonawanda, N. Y.

Architectural Service Sheets. 8½ x 11 in. Illustrated. Working drawings of construction, with standard specifications for design and construction of same.

Illinois Zinc Company, 280 Broadway, New York, N. Y.

Pure Rolled Zinc. (Corrugated and Plain Sheets.) Booklet. 3½ x 6¼ in. 8 pp. Illustrated. Facts regarding adaptability of zinc for roofing. Specifications of corrugated zinc sheets. Weights per square. Comparative gauge lists.

The Roof That's Always New. Booklet. 3⅜ x 6 in. 12 pp. Illustrated. Story of Illinois Zinc Shingles, their everlasting and artistic qualities. Information regarding a complete zinc roof, shingles, starting piece, valley, ridge and hip piece.

Ruberoid Co., The (formerly the Standard Paint Co.), 95 Madison Avenue, New York, N. Y

Instructions for Laying Built-up Roofs. Booklet. 8½ x 11 in. Illustrated.

Ruberoid Facts Worth Knowing. Booklet. 6 x 9 in. 16 pp. Illustrated

Ruberoid Strip-shingle. Booklet. 3½ x 6¼ in. 16 pp. Illustrated in color.

Ruberoid Unit-shingle. Booklet. 3½ x 6¼ in. Illustrated in color.

N. & G. Taylor Company, 300 Chestnut Street, Philadelphia, Pa.

Selling Arguments for Tin Roofing. Booklet. 6¼ x 9¼ in. 80 pp. Illustrated. Describes the various advantages of the use of high grade roofing tin, gives standard specifications, general instructions for the use of roofing tin, illustrates in detail methods of application.

SAFETY TREADS

Universal Safety Tread Co., 40 Court St., Boston, Mass.

The Universal Safety Metal Tread. Booklet. 8½ x 11 in. 16 pp. Illustrated. Describes Safety Treads, with lead inserts in steel base, suitable for use on iron, wood or concrete stairs. Also the flat type, with "Alundum" surface, as well as special ladder treads for ships, power-house and engine-room open string stairways.

SEWAGE DISPOSAL

Kewanee Private Utilities, 442 Franklin St., Kewanee, Ill.

Specification Sheets. 7¾ x 10¼ in. 46 pp. Illustrated. Detailed drawings and specifications covering water supply and sewage disposal systems.

SHEATHING

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio

For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base.

STEEL DRESSERS

Janes & Kirtland, 133–135 West 44th St., New York, N. Y.

The White House Line. Booklet. 7¾ x 5¼ in. 24 pp. Illustrated. Describes and illustrates in detail WHITE HOUSE Steel Dressers and some of the separate units. Also contains typical layout and list of some of our clients.

Photographs. 5½ x 3½ in. Views of actual installations in private residences, schools, etc., sent on request.

STONE, BUILDING

Harrison Granite Company, 200 Fifth Avenue, New York, N. Y.

Harrison Granite Company, Clientele. 3¾ x 8¾ in. 24 pp. Illustrated. A partial list of clients with illustrations of examples of monuments and mausoleums.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 73*

STONE, BUILDING — Continued

Indiana Limestone Quarrymen's Association, Box 766, Bedford, Indiana.
Volume 3. Series A-3. Standard Specifications for Cut Indiana Limestone work. 8½ x 11 in. 56 pp. Containing specifications and supplementary data relating to the best methods of specifying and using this stone for all building purposes.
Vol. 1. Series B. Indiana Limestone Library. 6 x 9 in. 36 pp. Illustrated. Giving general information regarding Indiana Limestone, its physical characteristics, etc.
Vol. 27. Series B. Designs for Houses of Indiana Limestone. 8½ x 11 in. 32 pp. Illustrated. Being the best designs submitted in competition for a detached residence faced with Indiana Limestone conducted by *The Architectural Review.*

STORE FRONTS

Brasco Manufacturing Company, 5025 So. Wabash Ave., Chicago, Ill.
Brasco Catalog No. 26. 8½ x 11 in. 28 pp. Illustrated. Catalog illustrating and describing members of the Brasco and Brasco-Hester Construction. Includes copper-covered Brasco moulding and the Hester all metal moulding. The wood core of the Brasco has been creosoted and will last as long as the building.
Full-Size Details Brasco Copper Store Front Construction. 8¾ x 11 in. Complete in every particular. Shows practical installation of the construction.
Full-Size Details Brasco-Hester Copper Store Front Construction. 8¾ x 11 in. This type is all metal or hollow. Has a dust regulator at the base of the plate which does not stick.
Kawneer Co., The, Niles, Mich.
Kawneer Solid Copper Store Fronts. Catalog. "K." 8½ x 11 in. 32 pp. Illustrated. Information about various members used in the pioneer Kawneer construction.
A Collection of Successful Designs. Catalog. 9¼ x 6½ in. 64 pp. Illustrated. Showing by use of drawings and photographs many types of Kawneer Solid Copper Store Fronts.
Zouri Drawn Metals Co., B. J. 10, Chicago Heights, Ill.
Architects' Catalog. 8¾ x 11¾ in. 86 pp. Illustrated. Showing a true copy of the approval of the Underwriters' Laboratories. Showing a proper glazing specification, based on the Underwriters' Report.
Catalog B. J. 8. 6 x 9 in. 68 pp. Illustrated. Key to Getting the People In.

STUCCO BASES

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio.
For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base.

STUCCO, MAGNESITE

American Materials Company, 101 Park Avenue, New York; Weed Street and Sheffield Avenue, Chicago, Ill.
Elastica, the Stucco of Permanent Beauty. Catalog. 8½ x 11 in. 32 pp. Illustrated. Treatise on composition and application of Elastica Stucco.
Muller, Franklyn R. Co., Waukegan, Ill.
Everlastic Magnesite Stucco. Booklet. 8½ x 11 in.
United States Materials Co., Weed Street and Sheffield Avenue, Chicago, Ill. See American Materials Co.

TELEPHONE SYSTEMS

Federal Telephone & Telegraph Company, 1738 Elmwood Ave., Buffalo, N. Y.
Catalog No. 610. Booklet. 8½ x 10 in. 24 pp. Illustrated. Interior telephones for home, office, factory, hotel and apartment-house use.

TERRA COTTA

Atlantic Terra Cotta Co., 1170 Broadway, New York, N. Y.
Questions Answered. Booklet, 7½ x 5¼ in. 32 pp. Illustrated. A synopsis of questions most frequently asked by architects in relation to terra cotta, with brief but complete answers ; contains many illustrations.
National Terra Cotta Society, 1 Madison Avenue, New York, N. Y.
Standard Construction, Indexed, bound volume. 10½ x 16 in. 90 pp. 70 Illustrations. Standard forms of terra cotta construction with short article.
"The School." 10½ x 13½ in. 34 pp. 92 Illustrations. Types of school buildings with short descriptive articles. Volume I, brochure series.
"The Theatre." 10½ x 13½ in. 36 pp. 102 Illustrations. Types of theatre buildings with short descriptive articles. Volume II, brochure series.
"The Store." 10½ x 13½ in. 34 pp. 60 Illustrations. Types of store buildings with short descriptive articles. Volume III, brochure series.
Northwestern Terra Cotta Co., The, 2525 Clybourn Ave., Chicago, Ill.
Booklet. 8¼ x 11 in. 77 pp. Illustrated. Showing in a concise way the usefulness of terra cotta.

THERMOSTATS—See Heating Equipment

TILE, FLOOR AND WALL

Associated Tile Manufacturers, The, Beaver Falls, Pa.
Bring the Crowds to Your Market. Booklet. 8½ x 11 in. 16 pp. Illustrated. The use of Tile for the modern sanitary market.
Swimming Pools. Booklet. 8½ x 11 in. 32 pp. Illustrated. A handbook on swimming pools and their construction.
Norton Company, Worcester, Mass.
Alundum Safety Tile. Booklet. 5 x 8 in. 15 pp. Illustrated. Description of material and its installation.
Tests of Alundum Tile. Booklet. 5 x 8 in. 18 pp. Illustrated. Describes its composition and proves its adaptability for its innumerable purposes.

TILE, HOLLOW

Hollow Building Tile Association, Dept. 1812, Conway Bldg., Chicago, Ill.
Handbook of Hollow Building Tile Construction. 8½ x 11 in. 104 pp. Illustrated. Complete treatise on most approved methods of hollow tile building construction and fireproofing.

TILE, HOLLOW — Continued

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
Standard Wall Construction Bulletin 174. 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.
Industrial Housing Bulletin 172. 8½ x 11 in. 14 pp. Illustrated. Photographs and floor plans of typical workingmen's homes.
Natco on the Farm. 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.
Fireproof Buildings of Natco Hollow Tile. Booklet 8½ x 11 in. 16 pp. Illustrated. Showing the use of Natco Hollow Tile for private residences.

VALVES

Crane Co., 836 S. Michigan Ave., Chicago, Ill.
No. 50 Steam Pocket Catalog. 4 x 6½ in. 775 pp. Illustrated. Describes the complete line of the Crane Co.
Jenkins Bros., 80 White Street, New York.
The Valve Behind a Good Heating System. Booklet. 4½ x 7¼ in. 16 pp. Color plates.
Jenkins Valves for Plumbing Service. Booklet. 4½ x 7¼ in. 16 pp. Illustrated.
Warren Webster & Co., Camden, N. J.
The Webster Type N Modulation Valves. Catalog. 8 x 10½ in. 8 pp. Illustrated. Describing a quick response, conveniently operated, and simple radiator supply valve.
The Webster Sylphon Trap. Booklet. 8 x 10½ in. 12 pp. Illustrated. Explaining the importance of the properly operating radiator return trap.

VENETIAN BLINDS AND AWNINGS

The J. G. Wilson Corporation, 11 East 36th St., New York, N. Y.
Booklet. 6 x 9 in. 32 pp. Illustrated. Describes the application of these light-regulating devices, with many photographic reproductions of homes, schools, hotels, clubs and institutions where these products are used.

VENTILATION

Clarage Fan Company, Kalamazoo, Mich.
Catalog No. 52. 8½ x 11 in. 84 pp. Illustrated. Describes Clarage Kalamazoo Multiblade Fans and Heaters for use in schools, churches, hospitals and industrial plants. Engineering data, capacity tables and dimensions included.
Globe Ventilator Co., Dept. P, Troy, N. Y.
Globe Ventilator's Catalog. 6 x 9 in. 32 pp. Illustrated.

WALL BOARDS

Carey Co., The Philip, Cincinnati, Ohio.
Carey Board for Better Building. Catalog. 6 x 9 in. 32 pp. Illustrated.
United States Gypsum Company, 205 West Monroe St., Chicago, Ill.
Walls of Worth. Booklet. 8½ x 11 in. 24 pp. Illustrated. Describes Sheetrock, the fireproof wall board, its advantages and uses.

WATER FILTERS

The Graver Corporation, East Chicago, Ind.
The Water Supply for Swimming Pools. Bulletin 500. 12 pp. 8½ x 11 in. Illustrated. Re-filtering or re-circulating method of purifying and heating water for swimming pools. Contains data on the design, construction and operation of pools. Fully illustrated. Also literature on all types of Water Softeners.
Graver Vertical Pressure Filters. Bulletin 502. 8½ x 11 in. 12 pp. Illustrated. Contains full data on capacities, design, coagulant apparatus, efficiency, etc., o filters. Also literature on all types of water-softening equipment.

WATERPROOFING

Ruberoid Co., The, 95 Madison Ave., N. Y.
Impervite. Circular. 8½ x 11 in. 4 pp. Illustrated. An integral waterproofing compound for concrete, stucco, cement, mortar, etc.
Sandusky Cement Co., Dept. F., Cleveland, Ohio.
Medusa Waterproofing. Booklet. 6¾ x 9 in. 38 pp. Illustrated.
The Truscon Laboratories, Detroit, Mich.
Science and Practice of Integral Waterproofing. 4 x 9 in. 33 pp. Illustrated. Discusses why concrete requires waterproofing and properties an integral waterproofing must possess. Full specifications for waterproofing mass concrete, cement stucco and cement plaster coat.

WATER SOFTENERS

Permutit Company, The, 440 Fourth Ave., New York, N. Y.
Permutit-Water softened to No (Zero) Hardness. Booklet. 8½ x 11 in. 32 pp. Describing the original Zeolite process of softening water to zero hardness. An essential for homes, hotels, apartment houses, swimming pools, laundries, textile mills, paper mills, ice plants, etc., in hard water districts.

WINDOW HARDWARE

The Kawneer Company, Niles, Mich.
Kawneer Simplex Windows. Catalog. 8½ x 10½ in. 16 pp. Illustrated. Complete information, with measured details, of Kawneer Simplex Weightless Reversible Window Fixtures, made of solid bronze. Shows installations in residences and buildings of all sorts.
Detail Sheets and Installation Instructions. Valuable for architects and builders.
Samson Cordage Works, Boston, Mass.
Catalog. 3½ x 6¼ in. 24 pp. Illustrated. Covers complete line.
Smith & Egge Mfg. Co., The, Bridgeport, Conn.
Booklet. 6¾ x 9 in. 42 pp. Illustrated. Covers a complete line of chains, hardware and specialties.

WINDOWS, CASEMENT

Crittall Casement Window Co., 2703 East Atwater Street, Detroit, Mich.
Catalog No. 18. 9 x 12 in. 56 pp. Illustrated.
Hoffman Mfg. Co., Andrew, 900 Steger Building, Chicago, Ill.
Hoffman Casements. Architects' Portfolio. 8½ x 11 in. Loose-leaf. Large scale working details for mill-work and installation.
F. S. Details 20 x 23 in. and 15 x 22 in. Working details for mill-work and installation.
Hoffman Casements Catalogue. 7 x 8½ in. 16 pp. Illustrated.
Hope & Sons, Henry, 103 Park Avenue, New York.
Catalog. 12¼ x 18½ in. 30 pp. Illustrated. Full size details of outward and inward opening casements.

WOOD — See Lumber

"Made to Walk on"

You know Johnson's Floor Wax. It is used all over the civilized world. We want you to know our Floor Varnish, too. It is of the same high quality as our Floor Wax. To prove this statement we are offering you a pint can absolutely free—all charges prepaid.

Johnson's Floor Varnish dries dust-proof in 2 hrs. and hard over night. It imparts a beautiful, high lustre—has good body—will give long wear—is absolutely waterproof—and will stand all reasonable tests.

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FLOOR VARNISH

Johnson's Floor Varnish is just the thing for hard and soft wood floors. Also for furniture, woodwork and trim of all kinds. May be rubbed if desired.

Johnson's Floor Varnish is tough and durable. It gives a beautiful, high gloss which will not chip, check, mar, blister or scratch white. It is very pale in color, so can be used on the lightest woods.

Free to Architects

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S. C. JOHNSON & SON, Dept. AF-4, Racine, Wis.
"The Wood Finishing Authorities"
Canadian Factory—Brantford

S. C. JOHNSON & SON,
Dept. AF-4, Racine, Wis.

Please send me free, all charges prepaid, a pint of JOHNSON'S FLOOR VARNISH.

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The best paint dealer here is..

The leading Architects of the country are now specifying

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Varnishes and Enamels

If you are still unfamiliar with the merits of these high grade products

WRITE TO-DAY

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Shingled walls and chimneys finished with Cabot's Old Virginia White
A. C. Jackson, Architect, New York

No "Painty" Effect

A Soft, Brilliant White with a real stain texture (no gloss) is the secret of the distinction of

Cabot's Old Virginia White

It is as cool and bright and handsome as a fresh coat of whitewash, and as lasting as the best paint. For shingles, siding, brickwork, stucco or stone. Old Virginia Tints have the same textural qualities in a variety of delicate, pastel-like colors.

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SAMUEL CABOT, Inc. Manufacturing Chemists **BOSTON, MASS.**

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Cabot's Creosote Stains, Insulating and Deadening Quilt, Brick and Stucco Stains, Conservo Wood Preservative, etc.

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Established 1844 Incorporated 1920

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Nearing the Century Mark in VARNISH MAKING

Our products have been specified by architects *continuously for ninety-five years.* What endorsement could be greater?

Dependable Varnishes

Excel in beauty, in utility, and are of exceptional wear. Made of highest grade fossil gums, oil of special refining and *pure* spirits of turpentine.

Trade **I-X-L No. 1** Mark
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Elastic, easy working, brilliant, waterproof. No cracking or chipping. Lasts indefinitely.

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Brings out the beauty of grain in hardwood floors. Exceptional in finish and in lasting quality.

Edward Smith & Company's High Grade Enamels and "Artisto" Finish attract architects and please clients.

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THE CHURCH INTERIOR

Liquid Velvet
THE SPECIFIED BRAND

In the ancient cathedral the art of the master painter is seen on ceiling and wall. In the modern church building instead of the embellishment of the artist they use a master paint—Liquid Velvet for wall and ceiling.

The illustration is of the Hennepin Avenue Methodist Church, Minneapolis, the interior of which wears a soft velvety finish that is a tribute to the value of Liquid Velvet as a flat and lasting wall enamel.

Liquid Velvet is specified by many leading architects because it is a flat enamel wall covering that keeps its appearance through a long life of wear. There is a quality and tone to the wall covered with Liquid Velvet which the artistic eye of the architect will appreciate.

If you have some test to which you would like to subject Master Varnish, write us. We will be glad to send you a sample sufficient to finish a table top or chair, for 10c. to cover postage.

Master Varnish

Another O'Brien product favored by the architect is Master Varnish. This is a veritable varnish armor for both interior and exterior woodwork. It will stand all tests to which a varnish may be subjected, many which no other varnish will stand.

Master Varnish is weather proof, water proof and mar proof. It will stand the test of scalding hot, icy cold or salt water. It is never dirty or seedy and never varies in body or drying.

O'BRIEN VARNISH CO.

Varnish and Paint Makers for Half a Century

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"Save the surface and you save all" Paint & Varnish

Hewitt & Brown
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THIS REGISTERED TRADE-MARK IS INDELIBLY STAMPED IN THE END OF EVERY BOARD OF TRUE "TIDEWATER" CYPRESS. LOOK FOR IT.

CYPRESS "The Wood Eternal"

is one of the best of exterior trim woods. Many careful judges think it the very best of all woods for outdoor use. Its extraordinary resistance to all rot influences makes a strong appeal to the thrifty mind. Its popularity with the public is based on a growing knowledge of its worth.

Let our "ARCHITECTS DEPARTMENT" help YOU. Our entire resources are at your service with Reliable Counsel.

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Woodwork finished throughout with Sherwin-Williams OLD DUTCH ENAMEL, an American product which "beats the Dutch" for initial and permanent whiteness. Made in White, Gray and Ivory, gloss or dull finish.

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COVER THE EARTH
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SEE OUR CATALOGUE IN SWEET'S

St. Mary's Hospital, Rochester, Minnesota
C. J. Johnston, St. Paul, Architect

RIPOLIN
REGISTERED TRADE MARK

Ripolin is ranked generally by architects as the most perfect decorative white finish in the world, and is almost invariably specified for the finer residences, public buildings and hotels.

Its general adoption by such prominent hospitals as St. Mary's at Rochester, Minn., is due, however, to two qualities more essential in the hospital than beauty—it is aseptic and durable.

THE RIPOLIN COMPANY
CLEVELAND, OHIO

THE ORIGINAL
HOLLAND
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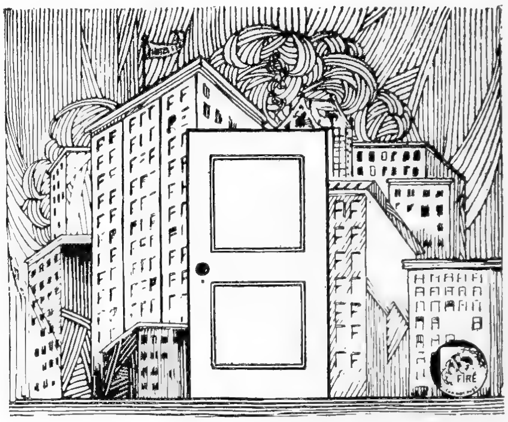

CHESLEY Doors are not expensive. Yet they are used in the highest class of construction and afford *absolute* protection from fire.

Chesley Doors are not expensive. Yet they are beautiful—easily painted or grained.

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Chesley Doors are not expensive. They are *standardized and shipped from stock.* Ask us to prove the advantage of using them in your next building.

See Sweet's or write

FIRE IT CAN NOT PASS
A. C. CHESLEY CO., Inc.
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For School Buildings

If you are designing school buildings or expect to do so, we honestly believe you will be interested in getting complete information on Fenestra Reversible Steel Windows.

These windows were designed especially for schools. They are easily washed and shaded, are fire resisting and come in a range of types and sizes and ventilating designs that make them adaptable to most any layout.

Moreover, they cost less than other types of reversible windows.

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STEEL WINDOWALLS
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The Webster Hotel,
Chicago, Ill.

Architect, Walter W. Ahlschlager.
Engineers, Fridstein & Co.
Glazed by Sharp, Partridge & Co.

The window glass throughout the splendid new Webster Hotel in Chicago is the product of the American Window Glass Company.

American Window Glass is distinctly a quality product, made to meet exacting requirements both in double or single strength. Its evenness and freedom from imperfections invariably win it preference.

AMERICAN WINDOW GLASS CO.
General Offices - Pittsburgh, Pa. - Branches in leading cities as listed in Sweet's

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Grammar
School at
Montebello,
Calif.
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Architects
Los Angeles*

Hoffman Casements

OUTWARD opening, top supported folding windows, providing maximum ventilation, convenient access for cleaning and flexibility of adjustment combined with ease of operation and weather tightness.

SUITABLE for schools, public buildings, dwellings and all buildings where convenience and practicability are desired.

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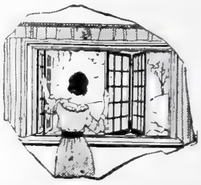
Pp. 1202-1205

Portfolio of Detailed Drawings mailed to architects upon request — Filing size.

Andrew Hoffman Mfg. Co.
Hoffman Casement Window
900 Steger Building
Chicago



Write for illustrated booklet of interest to home builders

For Dependable Service
SPECIFY
Caldwell Vertical Door Holder

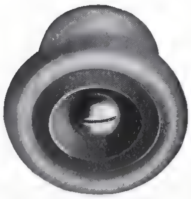
A Bracket affixes the Holder to the door, which gives strength at the base where needed. Rubbers are reinforced with hard leather gasket. Original cup shape.

No side ears.

1¼ inch drop.

Special large size 4¼ inch drop.

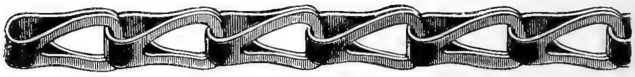
Furnished in all Finishes.



CALDWELL MFG. CO., Rochester, N. Y.

"Giant Metal," "Red Metal" and Steel

SASH CHAINS



Equipped with Smith & Egge Sash Chain

In homes of better construction where only the best equipment is used, Sash Chain will be found to have taken the place of cord. The difference between the initial cost is very slight when the wearing qualities of Chain and Cord are considered.

As originators of Sash Chain, and manufacturers of these chains for over forty years, we guarantee every foot of our product. Our business is built on Quality and Service.

Why not use the best?

See page 1092, Sweet's Catalog

The Smith & Egge Mfg. Co.
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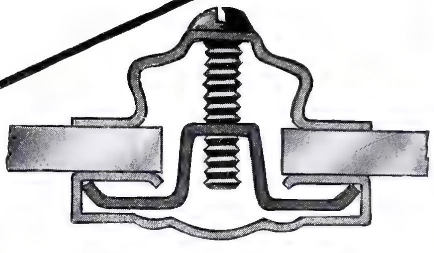
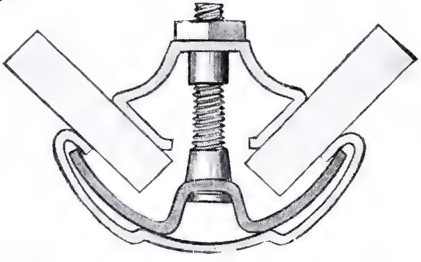
ORIGINATORS OF SASH CHAINS

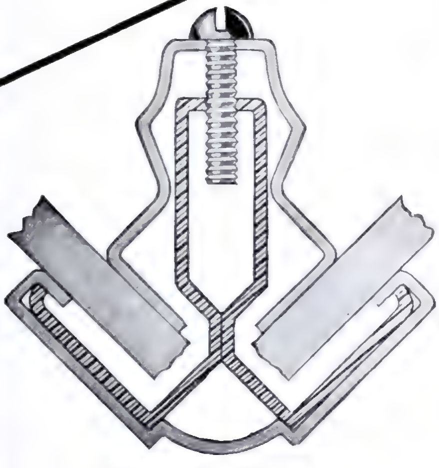
Brasco



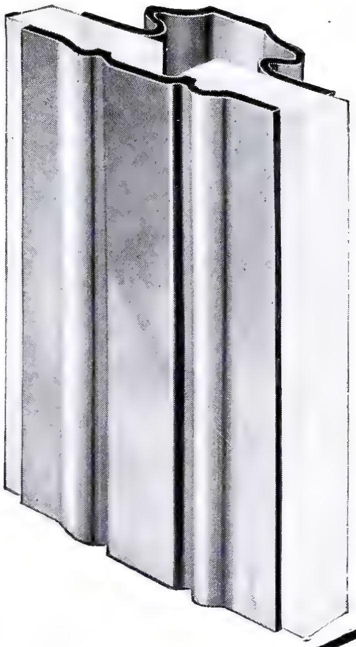
Division Bar No. 15

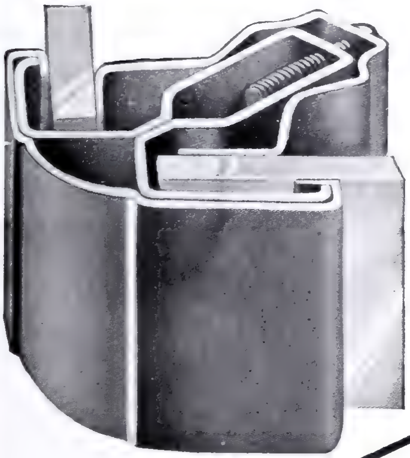


Corner Bar No. 10



Corner Bar No. 8





Durability

We believe illustrations of Brasco Corner Bars will give the practical architect a far better idea of Brasco durability than many pages of text matter. We want to point out that our continuous steel reinforcement evenly distributes the indirect pressure along the glass, gripping it well back of the edge.

You should specify Brasco Copper Store Fronts on your new work and alteration jobs not only for their durability but for their beauty, safety and economy. Portfolio of full size details free on request.

SEE OUR CATALOGUE IN SWEET'S

We want every reader of the Forum to know more about Brasco. May we send further particulars about this superior line of Copper Store Fronts?

BRASCO MANUFACTURING CO.

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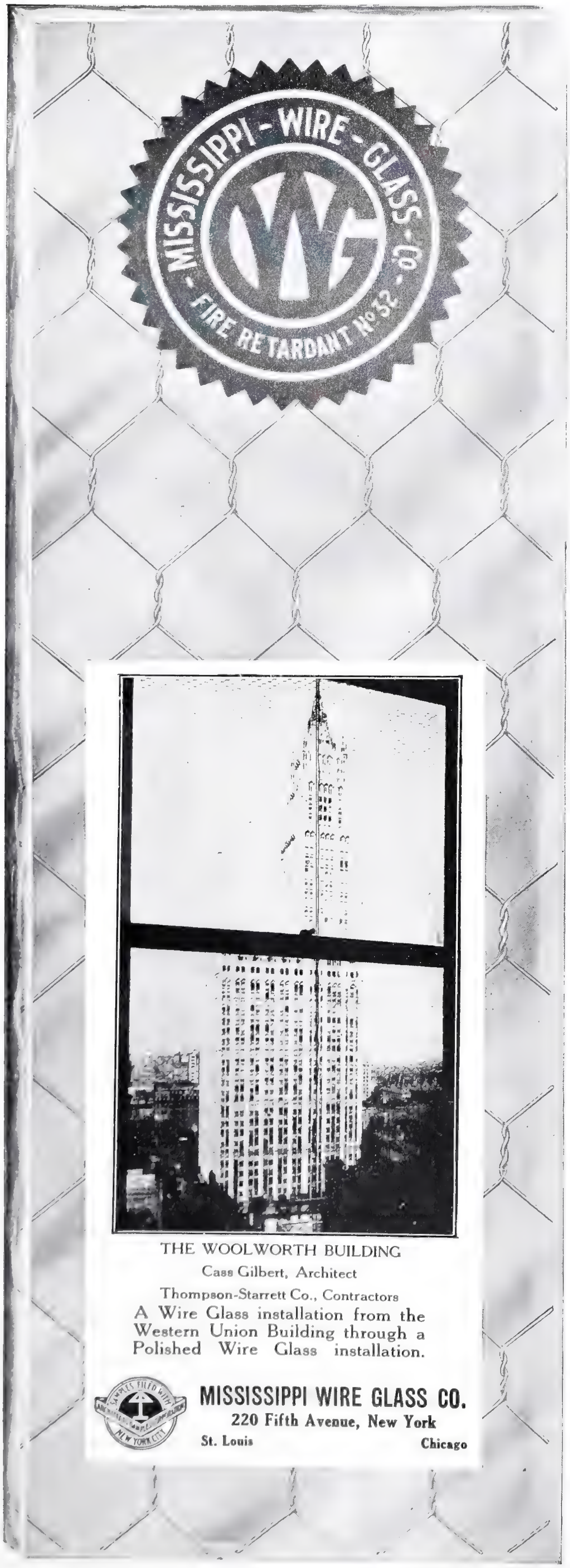


THE WOOLWORTH BUILDING
Cass Gilbert, Architect
Thompson-Starrett Co., Contractors
A Wire Glass installation from the Western Union Building through a Polished Wire Glass installation.

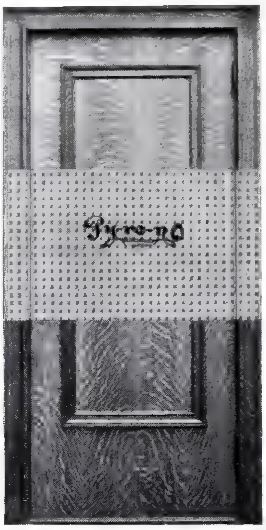
MISSISSIPPI WIRE GLASS CO.
220 Fifth Avenue, New York
St. Louis **Chicago**

Py-ro-no
TRADE MARK REGISTERED

FIREPROOF VENEERED DOORS
AND
TRIM

Recommended by Underwriters

Magnified section before veneer is applied



Showing asbestos sheathing indented into core

PYRONO doors and trim are recommended for use in office buildings, hotels, hospitals, apartments, schools and similar types of buildings for the openings to stairways, elevators, pipe shafts, corridor and room partitions and wherever ornamental, fireproof doors are desired.

Pyrono doors and trim are furnished in any design desired and in any cabinet wood. They are installed by carpenters just as regular hardwood doors and trim are installed.

A Few Recent Installations
Federal Reserve Bank Building, Chicago
Federal Reserve Bank Building, Kansas City
Drake Hotel, Chicago
Hanna Building, Cleveland
Cunard Building, New York City

Full information for details of construction will be furnished architects upon request

The Compound and Pyrono Door Co.
Factory and General Offices
St. Joseph - Michigan

Chicago 19 South LaSalle St.
Columbus, Ohio 20 East Gay St.
New York City 101 Park Ave.

Millions Saved
by one sentence

Insurance company records show that millions of dollars annually are paid out for plate glass breakage. Remember, this does not include the cost to the storekeeper of time lost or merchandise destroyed.

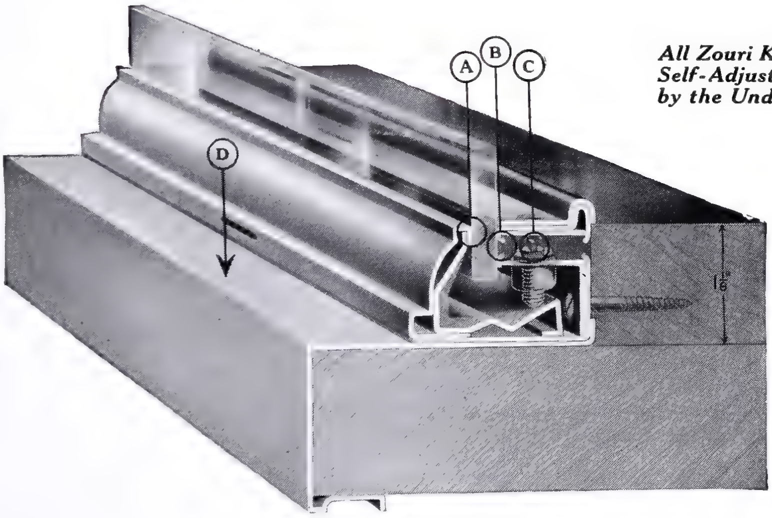
A great part of this tremendous loss can be eliminated. Do your part. Help us to fight the faulty installation evil. Plate glass breakage will be minimized if the following sentence is incorporated into store front specifications:

Glazing Specification

All Metal Sash, Corner Bars, Division Bars and Self-Adjusting Setting Blocks Used in Store Fronts Must Be Listed by the Underwriters' Laboratories.

Including this specification does *two* things: first, breakage of window front plate glass is made next to impossible from faulty setting; and second, the permanence of the architect's specified materials aids materially toward a worthy reputation.

All Zouri Key-Set Sash, Corner Division Bars and Self-Adjusting Setting Blocks Have Been Listed by the Underwriters' Laboratories.



No. 110 Zouri Combination Key-Set Sash and 705 Sill Covering

A is the point where the outer member presses against the glass, when the delicate watch-like turning of the Key at C brings the glass automatically into contact with the rabbet of gutter B sliding on the anti-friction Murname Self-Adjusting Setting Block.

The Sill Covering D extends from the inner side of the rabbet to the lower edge of the face eliminating joints—perpendicular screws or nails—positively protecting the wood against deterioration, for leakage is impossible.

Zouri Drawn Metals Company

Factory and General Offices

1630 EAST END AVENUE - - - - CHICAGO HEIGHTS, ILLINOIS

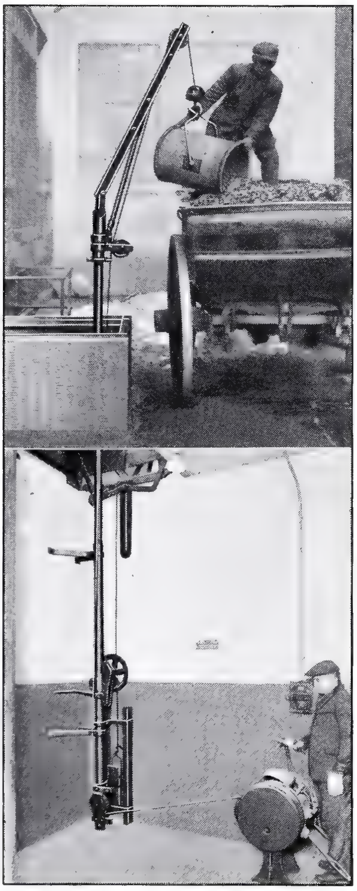


Illustration of Model D, G&G electrically operated Hoist at Mergenthaler Linotype Co., Brooklyn, N. Y.

78 Cans of Ashes Handled Electrically in 1 k.w.h.

THIS is the result of test conducted for us at Mergenthaler Linotype Co. by a large electrical engineering concern, for the purpose of demonstrating the economical use of electric current by the G&G overhead crane hoist. Test was made with 6 cans, and height of lift between cellar floor and top of crane is 21 feet.

Can	RAISING CANS				LOWERING CANS			
No.	Volts	Amps.	Watts	Secs.	Volts	Amps.	Watts	Secs.
1	238	5.20	1785	14	238	4.5	1446	12
2	238	5.10	1750	15	238	4.4	1417	14
3	240	5.10	1768	15	240	4.15	1502	14
4	240	5.15	1778	15	238	4.45	1430	14
5	243	5.15	1800	14	241	4.55	1480	14
6	236	5.00	1700	14	242	4.55	1485	15
Average Watts, 1764					Average Watts, 1460			
Average Seconds, 14.6					Average Seconds, 13.8			

Average cost of operation of this G&G Model D Overhead Crane Hoist (current consumption only, based on current cost of 3 cents per k.w.h.) is, therefore, 1 cent for raising and lowering every 26 cans.

See scale drawings and specifications in Sweet's. Specifications also in American Architect Specification Manual

GILLIS & GEOGHEGAN
544 West Broadway - New York

The G&G ELECTRIC Telescopic Hoist
REG US PAT OFF

RELIANCE FIREPROOF DOORS

Another high grade structure equipped with Reliance Bronze Doors is the Hotel Plaza addition, New York; Warren & Wetmore, architects; George A. Fuller Company, general contractor.

In Reliance products you will find embodied every improvement known to the science of building fireproof doors and windows. Their installation in hundreds of America's best hotels, hospitals, apartment and office buildings is proof of their superiority.

The attention of architects who contemplate the use of fireproof doors, windows, partitions and trim is especially directed to our Drafting and Sales Departments, which will be pleased to lend every assistance in submitting special designs and prices to meet the requirements of any special condition of construction.

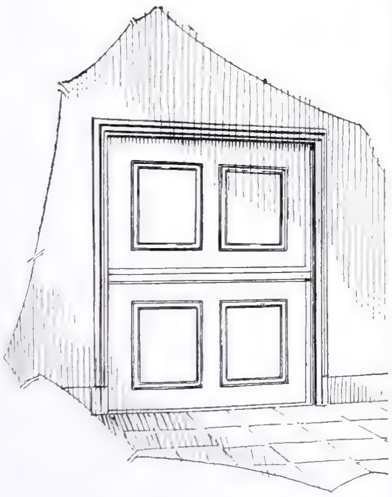
Reliance Fireproof Door Co.
Brooklyn, N. Y.

IF WE FILLED SIXTEEN pages with type and asked for sixty minutes of your time to read a list of PEELLE Door users, we would be demanding too much.

As a means of emphasizing the superiority of our doors to you, we modestly and honestly state that thousands of the largest and most progressive concerns in the world have PEELLE Truckable, Counterbalanced Freight Elevator Doors installed in their buildings.

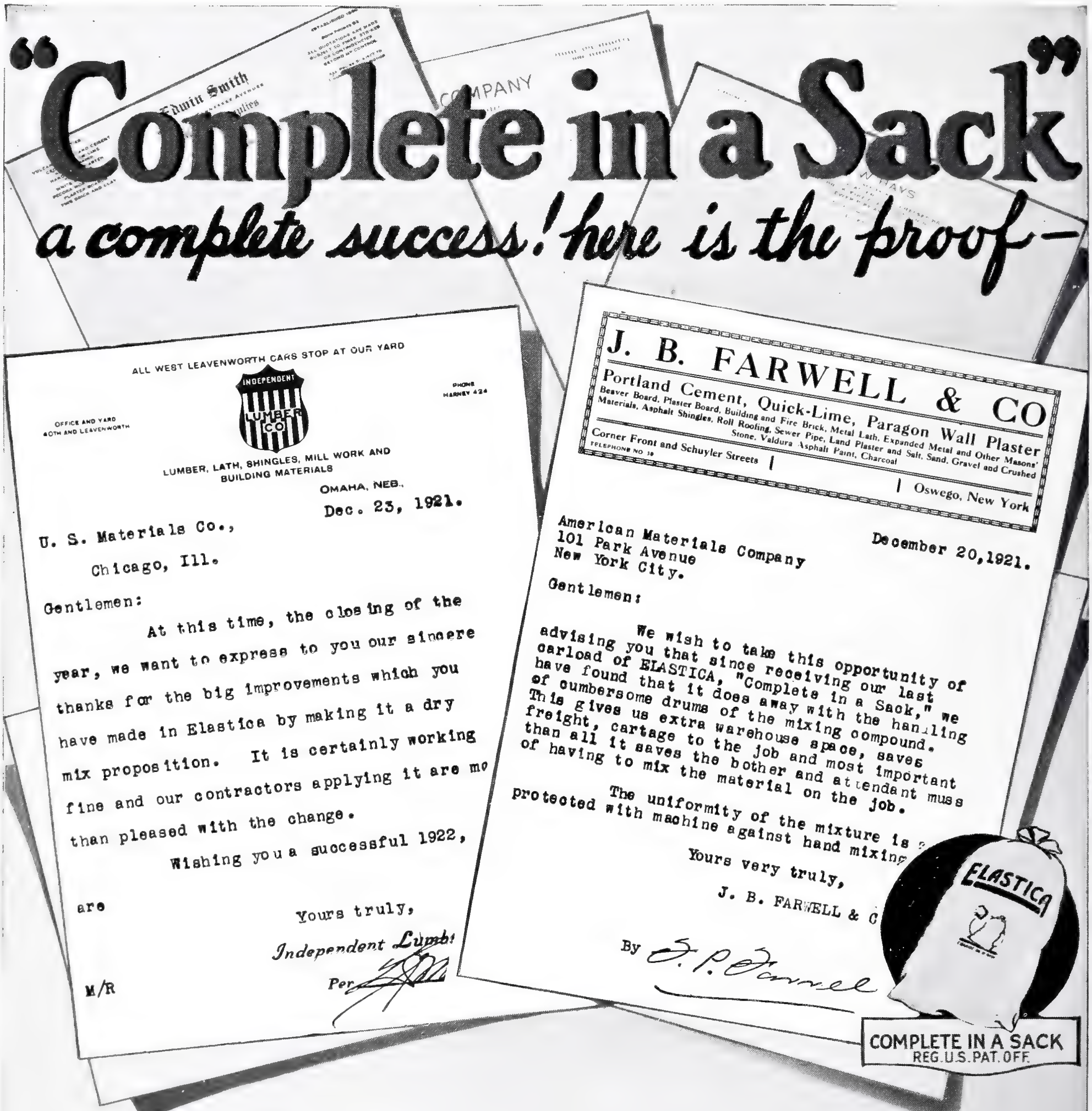
PEELLE
COUNTERBALANCED - TRUCKABLE
Freight
ELEVATOR DOORS

The PEELLE Counterbalanced Door Construction is one of the advantages thoroughly explained in "Elevator Door Efficiency," our new catalog. A copy awaits your request.



K-1 PEELLE Kalamein Paneled Door, two solid panels in each half. (Labeled by Underwriters' or Factory Mutual Companies as specified.)

THE PEELLE COMPANY
BROOKLYN • NEW YORK
Branch Offices:
Boston Cleveland Chicago Philadelphia
Agencies in Twelve Cities in United States and Canada



"Complete in a Sack"

a complete success! here is the proof—

ALL WEST LEAVENWORTH CARS STOP AT OUR YARD

INDEPENDENT LUMBER CO

OFFICE AND YARD
40TH AND LEAVENWORTH

PHONE
HARNEY 424

LUMBER, LATH, SHINGLES, MILL WORK AND
BUILDING MATERIALS

OMAHA, NEB.,
Dec. 23, 1921.

U. S. Materials Co.,
Chicago, Ill.

Gentlemen:

At this time, the closing of the
year, we want to express to you our sincere
thanks for the big improvements which you
have made in Elastica by making it a dry
mix proposition. It is certainly working
fine and our contractors applying it are mo
than pleased with the change.

Wishing you a successful 1922,

are

Yours truly,

Independent Lumb

Per

M/R

J. B. FARWELL & CO

Portland Cement, Quick-Lime, Paragon Wall Plaster

Beaver Board, Plaster Board, Building and Fire Brick, Metal Lath, Expanded Metal and Other Masons' Materials, Asphalt Shingles, Roll Roofing, Sewer Pipe, Land Plaster and Salt, Sand, Gravel and Crushed Stone, Valdura Asphalt Paint, Charcoal

Corner Front and Schuyler Streets
TELEPHONE NO 38

Oswego, New York

American Materials Company
101 Park Avenue
New York City.

December 20,1921.

Gentlemen:

We wish to take this opportunity of
advising you that since receiving our last
carload of ELASTICA, "Complete in a Sack," we
have found that it does away with the handling
of cumbersome drums of the mixing compound.
This gives us extra warehouse space, saves
freight, cartage to the job and most important
than all it saves the bother and attendant muss
of having to mix the material on the job.

The uniformity of the mixture is
protected with machine against hand mixing

Yours very truly,

J. B. FARWELL & C

By J. P. Farwell

ELASTICA

COMPLETE IN A SACK
REG. U.S. PAT. OFF.

WISCONSIN LIME & CEMENT CO.
CONWAY BLDG., CHICAGO, ILL.

AMERICAN MATERIALS CO.
101 PARK AVENUE, NEW YORK CITY

ART STUCCO MATERIALS CO.
12854 OAKLAND AVE., DETROIT, MICH.

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ELASTICA

REG. U.S. PAT. OFF.

THE IDEAL EXTERIOR WALL COVERING

The simple Carney mixing formula prevented mistakes and carelessness in the walls of this beautiful summer residence of A. R. Erskine at South Bend, Ind.

Architects: Austin & Shambleau, South Bend, Ind.

Contractors: E. P. Strandberg Co., Chicago, Ill.

Specify: One Part Carney, Three Parts Sand---That's All

UPON reading this formula probably one of the first questions that arises in your mind is, "How about the lime?" And right there is the difference between Carney and Portland Cement for brick mortar, for no lime is required in the mixing of Carney mortar.

This does not mean, however, that there is no lime in mortar made with Carney. One superior feature of Carney is due to the fact that nature added the lime chemically in just the right proportion, thousands of years ago.

This simplified formula gives many advantages. It saves labor costs for slaking and mixing. Carelessness and adulteration at the mortar box are impossible with Carney. This specification means fewer men at the mortar box can supply more men on the wall. Obviously a specification like that above will lower your bids.

Mortar by this specification enables the men to lay more brick per day and more from a barrel of cement. The mortar can stand over night and be used by adding water. By soaking the neat cement a barrel and a half of putty can be obtained from one barrel of Carney. This is a saving of 50 per cent on cement.

Carney has made the walls in America's finest buildings a solid job of masonry in which the mortar is harder than the brick or tile it joins. Carney is superior for wall bearing buildings.

Worth Your Investigation

Surely a cement with these advantages is worth your investigation. Write for the illustrated book that gives complete details.

Carney's Cement Company
Cement Makers Since 1883
Mankato, Minn.

District Sales Offices:
Leader-News Bldg., Cleveland; Chamber of Commerce Bldg., Chicago; Omaha National Bank Bldg., Omaha; Syndicate Trust Bldg., St. Louis; Book Bldg., Detroit; Builders' Exchange, Minneapolis
Specifications: 1 part Carney, 3 parts sand; no lime

CARNEY'S CEMENT
The Bond That Guarantees The Wall

CARNEY'S CEMENT

For Brick and Tile Mortar

Permanent Stucco with Atlas White

STUCCO has deservedly become a most popular type of construction. One essential of good stucco is that it be permanent.

Stucco properly made from Atlas White Portland Cement is as permanent as concrete, because it *is* concrete. It has been proven satisfactory through years of exacting use. A wide variety of pleasing finishes are shown in our book, "The Stucco House," a copy of which should be in every architect's hands.

For over a quarter century Atlas Portland Cement has been deservedly known as "the Standard by which all other makes are measured."

The panel, a strip 36 inches deep, from an actual wall, shows a rather dry mix applied with irregular pressure and motion of the trowel. Permanent finishes such as this are only possible with Portland Cement Stucco.

THE ATLAS PORTLAND CEMENT COMPANY
NEW YORK — BIRMINGHAM — CHICAGO
Boston Philadelphia St Louis
Dayton Des Moines

¶ Ornamental pool, estate of Mr. B. G. Work, Oyster Bay, Long Island. "Sagamore Hill," the Roosevelt home, is directly opposite. Mr. Work is President of The B. F. Goodrich Company. ¶ Messrs. Delano & Aldrich, New York, Architects. Central Building Co., Worcester, Mass., Contractors; Medusa Waterproofing furnished by Tomkins Bros., Newark, N. J.

Measure "Medusa" Values in Terms of Your Clients' Dollars

BEFORE specifying the integral waterproofing for the cement work on the B. G. Work Estate, competitive samples of concrete were made with the available aggregates, using various brands of waterproofing. Extensive tests then showed that, for each dollar paid for waterproofing, *the specimens made with "Medusa" contained the least moisture per cubic yard of concrete.*

Medusa Waterproofing is the *original* integral waterproofing for cement. Architects may either specify it separately (either powder or paste) for addition to cement at the job; or may specify Medusa Waterproofed White or Gray Cements, which are our standard portland cements with the Waterproofing added in the correct proportions and thoroughly ground in at the mill.

¶ Our new booklets describe Medusa White Cement and Medusa Waterproofing. Explicit specifications; interesting illustrations. We shall be pleased to send them.

THE SANDUSKY CEMENT COMPANY
Department F **Cleveland, Ohio**

Manufacturers of Medusa Stainless White Cement (Plain and Waterproofed); Medusa Gray Portland Cement (Plain and Waterproofed); and Medusa Waterproofing (Powder or Paste).

MEDUSA
WATERPROOFING
for CONCRETE

BRIXMENT

Perpetual

TO GRACE a building with classic lines and design its interior with scientific regard for its intended use is to create an artistic monument such as not all men may leave. But the work of the architect does not stop here. For the outstanding feature of a monument is permanence. Unless all factors contributing to time- and weather-resistance are considered, the architect may find that his house is "built upon the sand."

Brixment, the perfect mortar, because of its smoothness and plasticity, makes possible masonry joints of the utmost solidity and strength; because of its water-repellent quality, it eliminates the danger of moisture-absorption and subsequent freezing, besides rendering the job waterproof.

It is uniform in quality and composition, enabling the architect to specify exactly and *be sure* of a properly proportioned mix with consequent *definite knowledge* of the resultant strength of the bond.

In addition, it is inert to mortar colors, requires less coloring and lends itself freely to such artistic shades and combinations as may best suit the aesthetic requirements of any particular building.

To specify Brixment is to do the utmost to insure the survival of your work.

LOUISVILLE CEMENT COMPANY,
INCORPORATED, LOUISVILLE, KY.

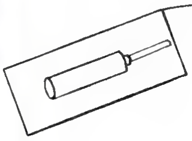
Send Today for this Free Booklet

It tells why BRIXMENT means stronger and more durable masonry and how it can save time, labor and money.

BRIXMENT
The Perfect Mortar

MAKES THE WALL A SOLID UNIT

"Spreads like warm butter"
TIGER White Rock FINISH
"Spreads like warm butter"
50LBS
TIGER White Rock FINISH
"Spreads like warm butter"
NET
50 LBS

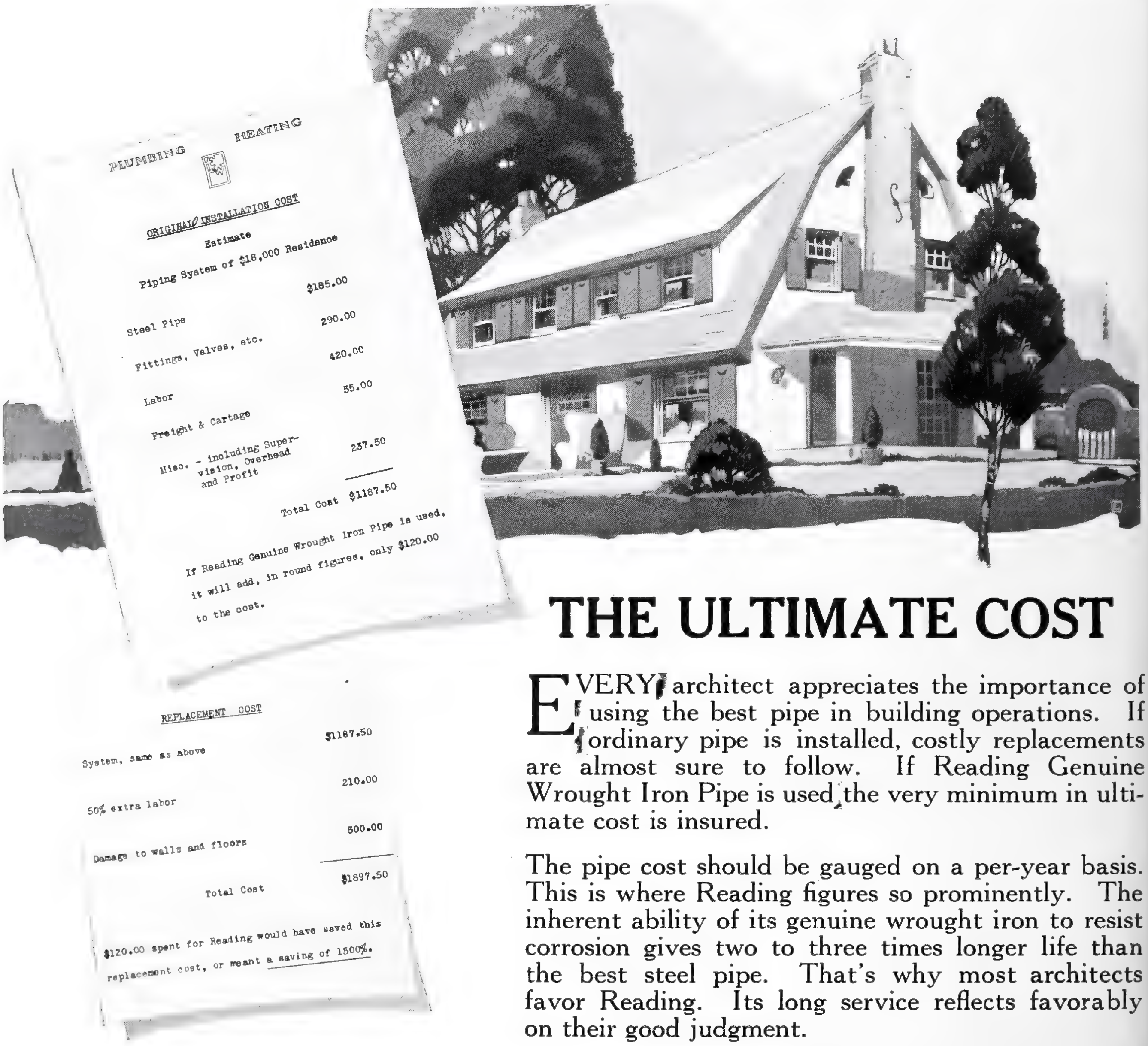


"Spreads like warm butter"

PUTTY made from Tiger Finish remains plastic long enough to trowel and float over the surface perfectly. There is no rolling up under the trowel or pulling with putty made with Tiger Finish.

See Sweet's for full particulars about using Tiger Finish — the lime which *"Spreads like warm butter."*

The Kelley Island Lime & Transport Co.
World's Largest Producer of Lime
Leader-News Building
CLEVELAND



PLUMBING HEATING

ORIGINAL INSTALLATION COST

Estimate

Piping System of $18,000 Residence

Steel Pipe	$185.00
Fittings, Valves, etc.	290.00
Labor	420.00
Freight & Cartage	55.00
Misc. - including Supervision, Overhead and Profit	237.50
Total Cost	$1187.50

If Reading Genuine Wrought Iron Pipe is used, it will add, in round figures, only $120.00 to the cost.

REPLACEMENT COST

System, same as above	$1187.50
50% extra labor	210.00
Damage to walls and floors	500.00
Total Cost	$1897.50

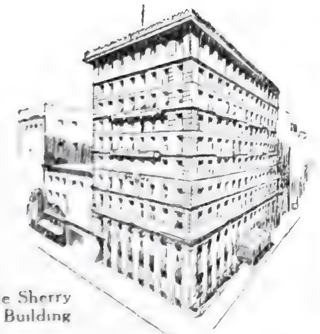
$120.00 spent for Reading would have saved this replacement cost, or meant a saving of 1500%.

THE ULTIMATE COST

EVERY architect appreciates the importance of using the best pipe in building operations. If ordinary pipe is installed, costly replacements are almost sure to follow. If Reading Genuine Wrought Iron Pipe is used, the very minimum in ultimate cost is insured.

The pipe cost should be gauged on a per-year basis. This is where Reading figures so prominently. The inherent ability of its genuine wrought iron to resist corrosion gives two to three times longer life than the best steel pipe. That's why most architects favor Reading. Its long service reflects favorably on their good judgment.

Write for the booklet "The Painted Molecule." It explains why Reading resists corrosion.



The Sherry Building

When New York's famous Sherry Building—erected in 1897—was remodeled during 1919 into the present Guaranty Fifth Avenue Building, the original Reading Pipe, after twenty-two years of unfailing service, was in such excellent condition that it was re-installed in the new building.

"Reading" on every length

READING IRON COMPANY
Reading, Pennsylvania

World's largest manufacturers of genuine wrought iron pipe

READING
WROUGHT IRON PIPE

In San Antonio 22 Architects *Specify* 2" Partitions

Moore Building, San Antonio. These partitions, though 18 years old, are absolutely free from cracks. 27 gauge Kno-Burn with channels 12" o.c. was used.

Solid Metal Lath and plaster partitions 2" thick are fast supplanting heavier and more costly types of walls for hotels, hospitals, schools, office buildings, etc.

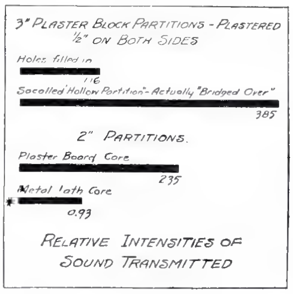
This type of construction not only saves floor space, lowers construction costs, but has high sound-proofing efficiency, recent tests showing that the relative intensity of transmitted sound through 2" solid Metal Lath and plaster partitions was but **0.95** as against the 2.35 reading of plaster board partitions and the 3.85 reading of 3" plaster block partitions.

Kno-Burn

METAL LATH

"The steel heart of plaster"

in 27 gauge or the larger meshed *Eureka* in 26 gauge are used with splendid success by architects all over the country in the building of these space-saving, economical partitions. Recommended specifications and full details given in "Fireproof Construction," mailed free on request.



Kno-Burn Metal Lath "The Steel Heart of Plaster"

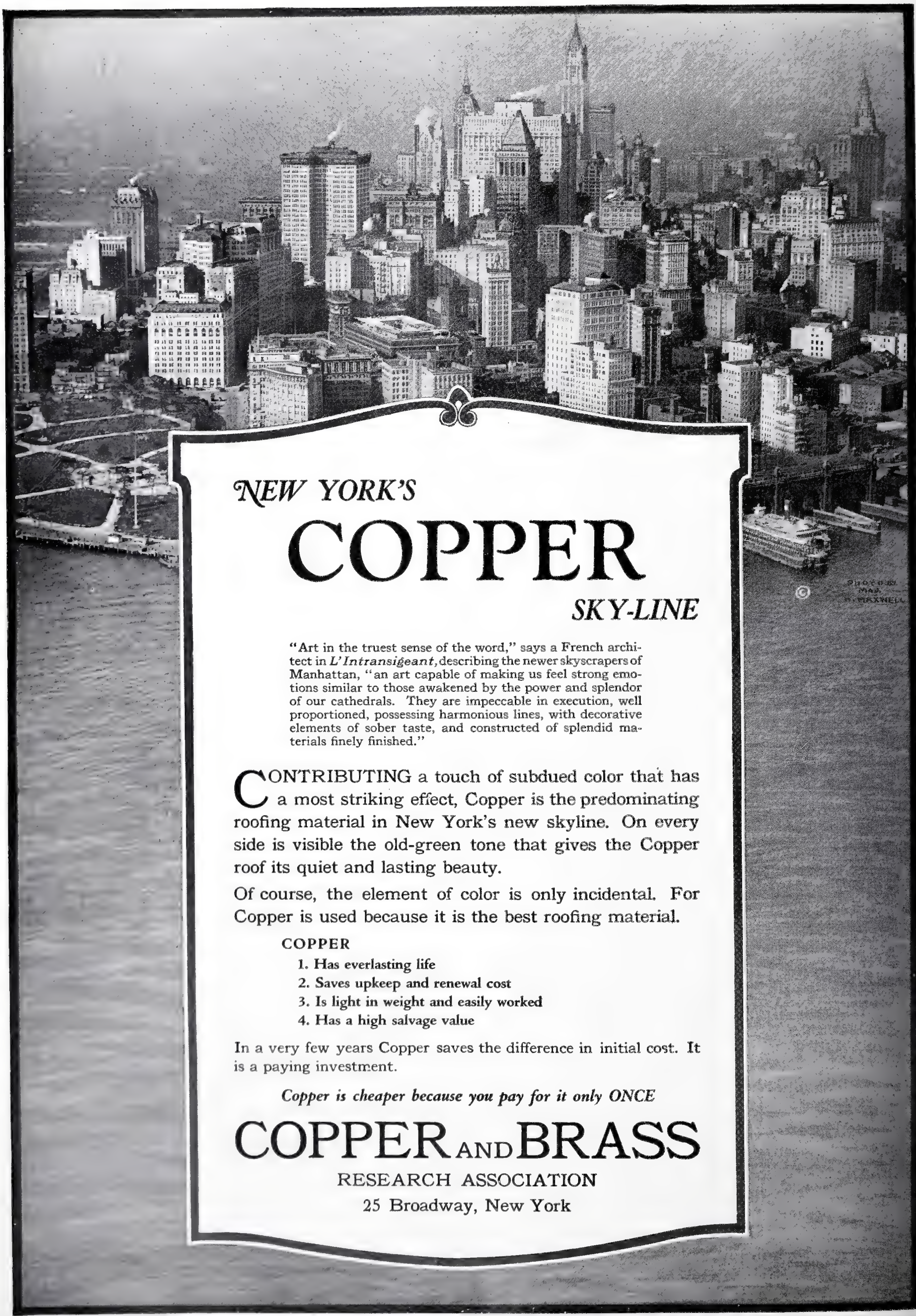
NORTH EXPANDED WESTERN METAL COMPANY

Manufacturers of Kno-Burn Metal Lath, Econo, Presteel Lumber, etc.

934 OLD COLONY BUILDING, CHICAGO

New York Atlanta Los Angeles Boston Cincinnati Minneapolis
St. Louis Dallas

NORTHWESTERN EXPANDED METAL CO.
CHICAGO



NEW YORK'S
COPPER
SKY-LINE

"Art in the truest sense of the word," says a French architect in *L'Intransigeant*, describing the newer skyscrapers of Manhattan, "an art capable of making us feel strong emotions similar to those awakened by the power and splendor of our cathedrals. They are impeccable in execution, well proportioned, possessing harmonious lines, with decorative elements of sober taste, and constructed of splendid materials finely finished."

CONTRIBUTING a touch of subdued color that has a most striking effect, Copper is the predominating roofing material in New York's new skyline. On every side is visible the old-green tone that gives the Copper roof its quiet and lasting beauty.

Of course, the element of color is only incidental. For Copper is used because it is the best roofing material.

COPPER

1. Has everlasting life
2. Saves upkeep and renewal cost
3. Is light in weight and easily worked
4. Has a high salvage value

In a very few years Copper saves the difference in initial cost. It is a paying investment.

Copper is cheaper because you pay for it only ONCE

COPPER AND BRASS
RESEARCH ASSOCIATION
25 Broadway, New York

TAYLOR'S TARGET AND ARROW ROOFING TIN PROTECTS MANY OF OUR NATION'S MOST TREASURED BUILDINGS

This trade-mark stamped on each sheet

THE PRODUCT — Time tells when Target and Arrow roofing tin is judged by the length of time it takes to make each sheet, for it takes 35 minutes to coat each sheet of Target and Arrow, whereas a sheet of ordinary roofing tin is coated in 20 seconds!

THE MANUFACTURERS — Time tells when Target and Arrow is judged by the length of time the manufacturers have been connected with the making of tin plate. The art of tinning metal plates was introduced into Wales by an ancestor of the founders of the firm of G. & W. Taylor, who, in 1810, started to import tin plate from Wales, where it was made especially to their order, but with the advent of the McKinley Tariff the Taylors began to manufacture tin plate in this country. Today their plant is completely equipped to manufacture roofing tin from pig iron to finished tin plate.

THE MAKERS—Time tells when Target and Arrow is judged by the length of time the actual makers have plied their art. Men start to work in the Taylor mills when they are mere boys. Here they learn their trade from experts who originally gained their experience in the tin mills of Wales at a time when Welsh tin plate makers were the best in the world.

THE USERS—Time tells when Target and Arrow is judged by the length of time it lasts, for there are records of its having protected property for 50, 60 and even 70 years, and countless records of perfectly satisfactory service for 30 years and more with this material still on the building and fit to render service for many years to come.

Full information on request

Four generations of the Taylor family have directed and controlled the business since its establishment — a veritable business heritage, with a reputation for quality products which each succeeding generation has striven to uphold.

Three generations of Storers—all working in the Taylor plant—typical of the loyalty and steadfastness of Taylor employees.

N. & G. TAYLOR COMPANY
PHILADELPHIA
PENNA.

Whether You Require

A well designed, ornate entrance gate, graceful and dignified--

Or, a fence that shall be both durable and ornate--

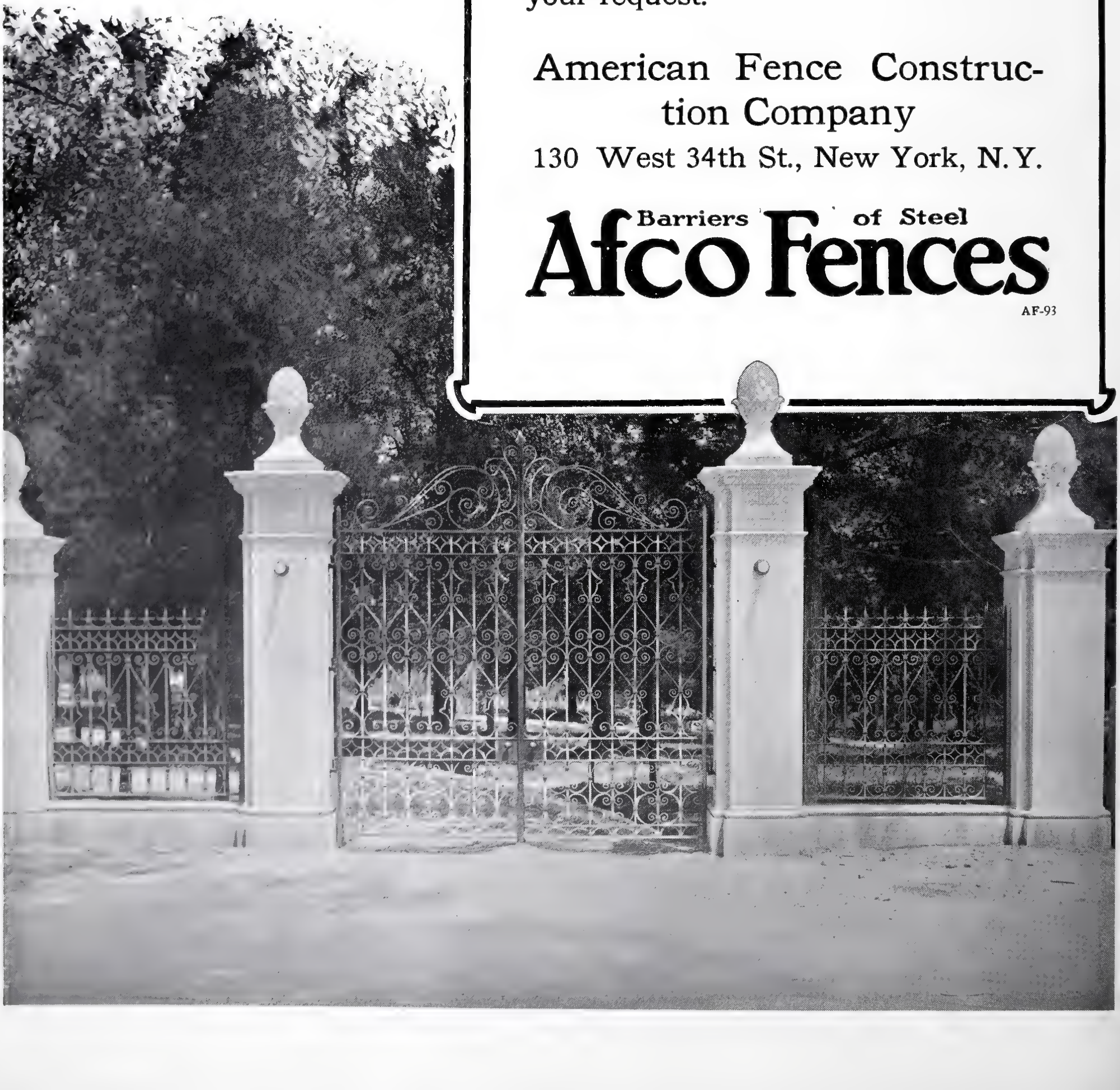
Or, a fence to prevent trespass and give maximum protection to grounds and property--

Our experience, gained in meeting many such requirements, is at your disposal. Catalog A21 will be sent at your request.

American Fence Construction Company
130 West 34th St., New York, N.Y.

Barriers of Steel
Afco Fences

AF-93



ROME
Quality
BRASS & COPPER

Rome Quality Seamless Brass Pipe installed by Thomas J. Dyer Co., Cincinnati, Ohio. Roofing materials by Witt & Brown

And for the New Dixie Terminal "Rome Quality" was chosen

The Dixie Terminal recently opened in Cincinnati, Ohio, is surely one of the finest and best equipped terminals. In this new gateway to the South, Rome Quality Seamless Brass Pipe for plumbing was installed to meet the demands of the hard and continuous, 24-hour-a-day service consequent in buildings of this kind.

It is natural that Rome Quality Seamless Brass Pipe was chosen, for it is widely known for the permanence and economy of its service. It is pipe made from pure metals, constantly under test by metallurgists, and produced with exacting care by the most improved methods of manufacture.

When you consider its virtues — non-corrosive qualities, long life, and freedom from costly repair and replacement — its economy is evident. Further, the dependability of Rome Quality Brass Pipe is an insurance against the leaky pipe menace to expensive furnishings and equipment.

In addition to the Seamless Brass Pipe, Rome Quality Sheet Copper was used for roofing.

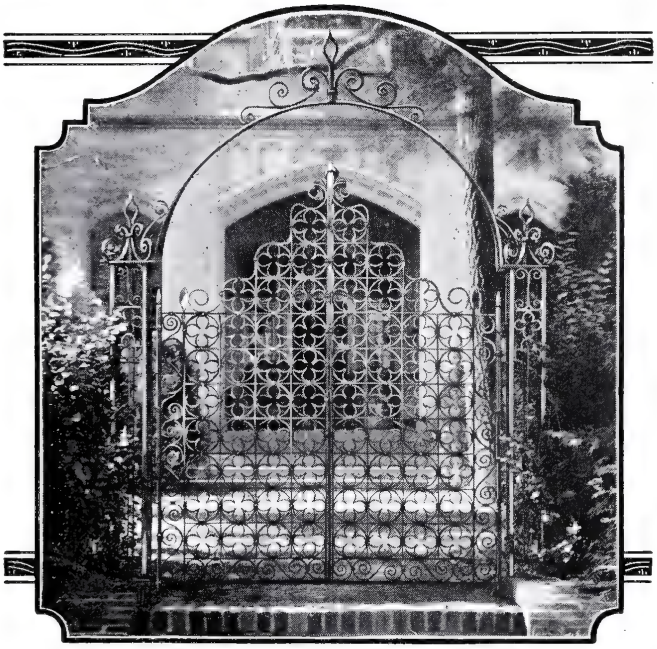
The Rome Brass and Copper Company has been engaged in producing quality brass pipe and copper products for many years. "Rome Quality" is favorably known and is recommended and used by architects, engineers, and plumbing contractors. By specifying "Rome Quality" you provide permanence.

BRASS COPPER BRONZE

Sheets; rolls; rods; anodes; tubes, brazed and seamless; strips; extruded shapes; angles and channels; tapered tubes and hose pipes; door rail; commutator bars and segments; electrical copper bar; and rivets and burs.

ROME BRASS AND COPPER COMPANY - ROME, N.Y.

BRASS ROME COPPER



Reproduction of Italian Gate
Residence of Mrs. Vera Sinclair, Rye, N. Y.

For Ornamental Metal Work—FISKE

ARCHITECTS and builders turn just as naturally to Fiske for ornamental metal work installation as to their watches for the time of day.

They have come to know, from practical results, that Fiske's 64 years of varied and successful experience is a guarantee of satisfaction.

Not alone ornamental metal work in iron, brass, bronze, etc., but also the more prosaic installations—from woven wire fences to fire escapes.

Whatever your problems in this sort of metal work, put them up to Fiske.

We will be glad to co-operate and produce from your own designs, or submit suggestions.

We contract to do installation work, or we will furnish plans and blueprints with complete erecting instructions.

Send for Fiske Catalogue 34

Iron Lamp and Bracket
This and a wide variety of designs in cast or wrought iron and bronze. Architects' special designs also executed. Send for Special Catalogue.

J.W.Fiske IRON WORKS
ORNAMENTAL IRON WORK
80 Park Place ~ New York
ESTABLISHED 1858

Samson Spot Sash Cord

"Spot it by the Spots"

Spot Cord is made of extra quality stock, is carefully inspected and is guaranteed free from the imperfections of braid and finish which make common sash cord wear out so quickly.

It can be distinguished at a glance by our trade mark, the Colored Spots, used only with this quality.

Send for catalogue and sample card

Samson Cordage Works
Boston, Mass.

MINERAL WOOL

for

FIREPROOFING
DEADENING OF SOUND AND INSULATION OF HEAT AND COLD IN

RESIDENCES
COLD STORAGE, ETC.

Moderate in Cost
Easily Applied

United States Mineral Wool Co.
280 MADISON AVENUE NEW YORK CITY

The Ouachita National Bank, Monroe, Louisiana, is completely Art Metal Equipped. (Albert S. Gottlieb, *Architect*)

What Art Metal Co-operation Means to the Architect

THE Art Metal Engineering Department with its force of 100 engineers is maintained to co-operate with architects in designing interior equipment in bronze, steel and marble for banks, libraries, court houses and commercial institutions.

And the Art Metal manufacturing organization with its third of a century experience in producing beautiful, durable and practical equipment executes the architect's designs and plans with such rare skill and craftsmanship as to fulfil the demands of your most critical clients.

Thousands of beautiful interiors in public and private buildings have been created through the joint co-operation of architects and the Art Metal organization.

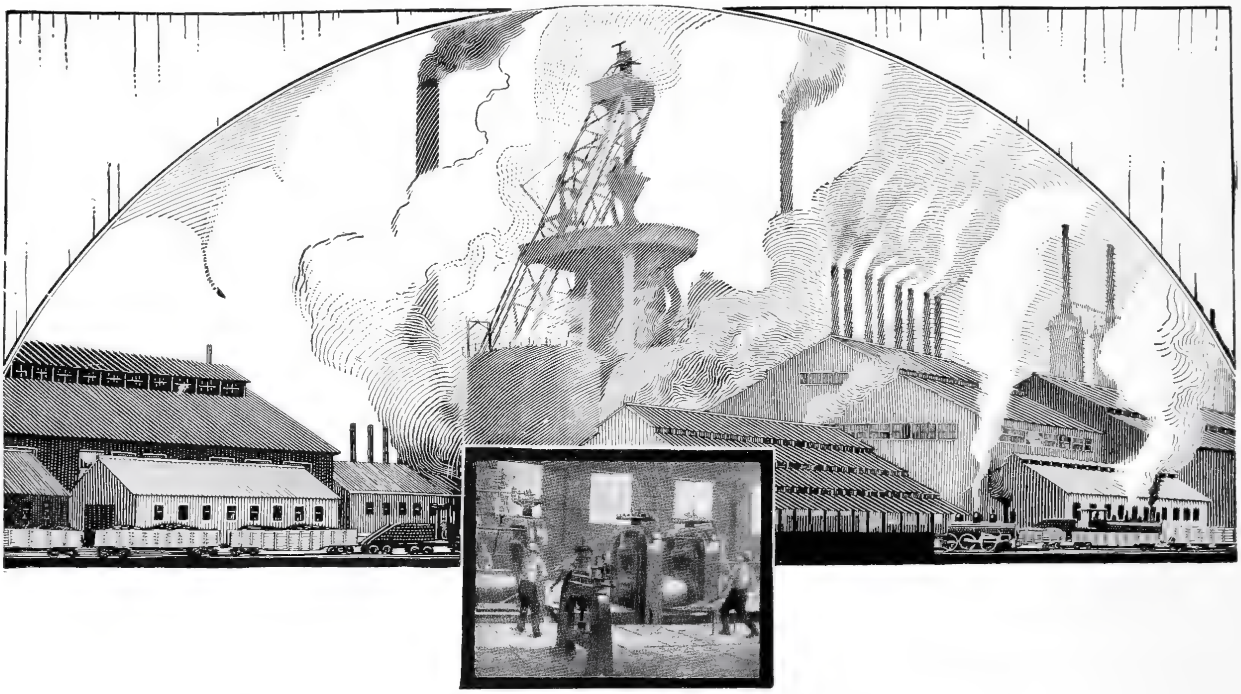
Art Metal
Jamestown, New York
U S A

We welcome the opportunity to consult with architects on their interior equipment problems.

Art Metal

JAMESTOWN, NEW YORK

World's Largest Makers of Steel, Bronze and Marble Equipment for Banks, Offices, Libraries and Court Houses



KEYSTONE COPPER STEEL

THE SHEET and TIN MILL Products manufactured in our twenty-seven plants are the recognized standards.

Through the extensive efforts of this Company the quality of the materials used for roofing and sheet metal work has been greatly improved. Insist upon products that have an earned and established reputation for trustworthiness. Their use is real economy.

American Sheet and Tin Plate Company
General Offices: Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES:
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KEYSTONE
COPPER STEEL

FOR every purpose to which sheet metal is adapted—in the shop or for construction purposes—KEYSTONE Copper Steel Products give superior satisfaction and service. They combine the excellence of good materials and able craftsmanship.

AMERICAN SHEET AND TIN PLATE CO
APOLLO
BEST BLOOM
TRADE MARK REGISTERED
PITTSBURGH
KEYSTONE
COPPER STEEL

Use Apollo-Keystone Galvanized. Shall we send new Weight Cards and Apollo Calendar?

KEYSTONE
COPPER STEEL

MF
32 POUNDS COATING
IC
KEYSTONE
COPPER STEEL

Write for booklets describing Keystone Copper Steel Sheets, Formed Products, and Terne Plates.

Gives Maximum Rust Resistance

The increased life of steel when alloyed with copper is a well established metallurgical fact. Time and weather have proved it.

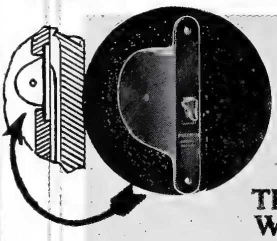
KEYSTONE quality is supplied in Black and Galvanized Sheets, Corrugated Sheets, Formed Roofing and Siding Products, Culvert and Flume Stock, Roofing Tin Plates, Etc.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

MANUFACTURERS OF

Sheet and Tin Mill Products of every description, including Black Sheets, Galvanized Sheets, Tin and Terne Plates, Electrical Sheets, Corrugated and Formed Roofing and Siding Materials, Special Sheets for Stamping, Wellsville Polished Steel Sheets, Automobile Body Sheets, Deep Drawing Sheets, Stove and Range Sheets, Black Plate, Etc.



New Tape Hook

Makes

Pullman Sash Balance

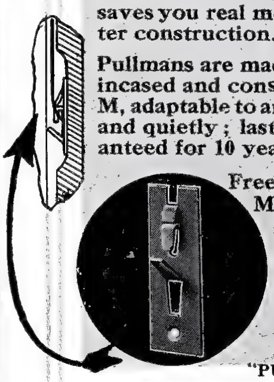
The 100% Window Device With No Increase in Price

The new Tape Hook makes it possible to fasten or unfasten the tape from the sash while sash is in place. No fussing with the stop; no mars or scratches; no refinishing; no lost time.

Pullman Sash Balances are easy to install and cost less than cords and weights. They are cheaper, not alone in first cost, but also because any carpenter can fit 2 to 4 windows with Pullmans while he would ordinarily fit one with cords and weights.

Pullmans eliminate box frames too. That alone saves you real money and makes a tighter, better construction.

Pullmans are made of pressed steel, are entirely incased and constructed in 3 UNITS, K, L and M, adaptable to any kind of sash. Operate easily and quietly; last indefinitely, in fact are guaranteed for 10 years.



Free illustrated catalog, full of Modern Window Operating Information, sent on request.

Pullman Mfg. Co.
233 South Avenue
Rochester, N.Y.

"PULLMANIZE YOUR WINDOWS"

American Sash Chain

represents the maximum in strength and wearing qualities. It will outwear any other type of sash suspension material and always sustains its load.

No. 80

No. 100

No. 130

No. 250

We have standardized the sizes of chain to correspond with the weights of sash for which they are intended.

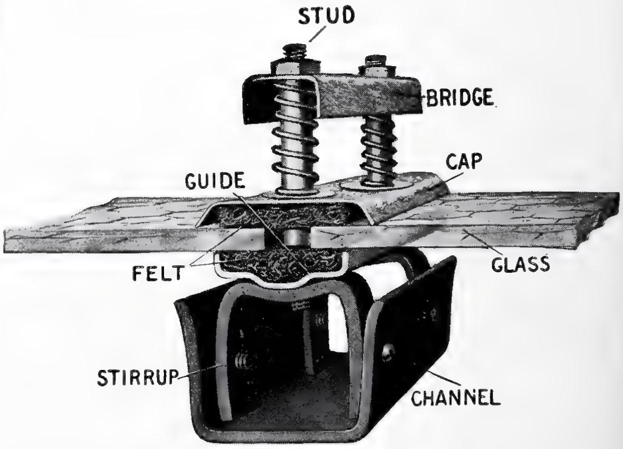
No.	80,	for	80 pound double-hung Sash
"	100,	"	100 " " " "
"	130,	"	130 " " " "
"	250,	"	250 " " " "

American Chain Company

Incorporated
Bridgeport, Connecticut

District Offices:
Boston Chicago New York Philadelphia
Pittsburgh Portland, Ore. San Francisco

Put Your Daylighting Problems up to Drouvé



Architects designing industrial plants, schools, office buildings, public buildings, etc., are invited to consult freely with our staff of trained daylighting engineers.

Our catalogue, containing details of construction and installation, sent free upon request.

THE G. DROUVÉ COMPANY
Bridgeport, Connecticut, U. S. A.

Daylight Headquarters

SARGENT
HARDWARE

HOTEL VANCOUVER
Vancouver, B. C.

FRANCIS S. SWALES, *Architect*
SKEENE & CHRISTIE, *Builders*

OUT in the great Northwest, the land of magnificent distances and incomparable scenery, there are beginning to be built buildings in keeping with the immensities of the country. Naturally among the first of these are to be found hotels, and the one shown herewith typifies in a sense the growing development of this vast section of our continent. That

SARGENT

Locks and Hardware form a part of the equipment of this modern hotel simply indicates, in a measure, the broad distribution and general adoption of our product.

SARGENT & COMPANY
Manufacturers
NEW HAVEN :: CONNECTICUT
New York Chicago

Sargent Hardware is sold in all cities by representative dealers

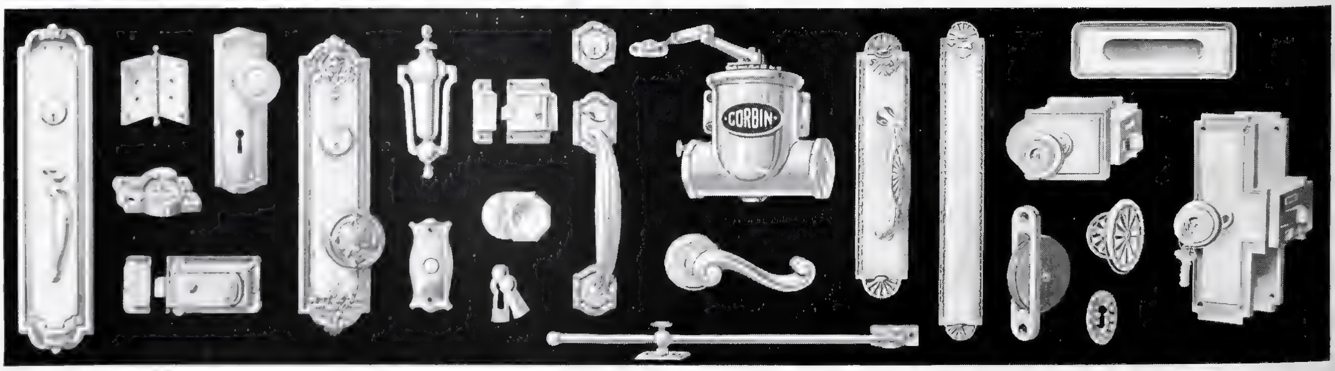
CORBIN

Good Buildings Deserve Good Hardware

ANNOUNCEMENT of the new Corbin slogan should be of more than passing interest to architects. In time it will give millions of people a new appreciation of the value of *Good Hardware.* The first full page announcement appears in

Saturday Evening Post of April 1st
National Geographic for April
House Beautiful - for April
House & Garden - for April
(A combined circulation of about 3,000,000 copies.)

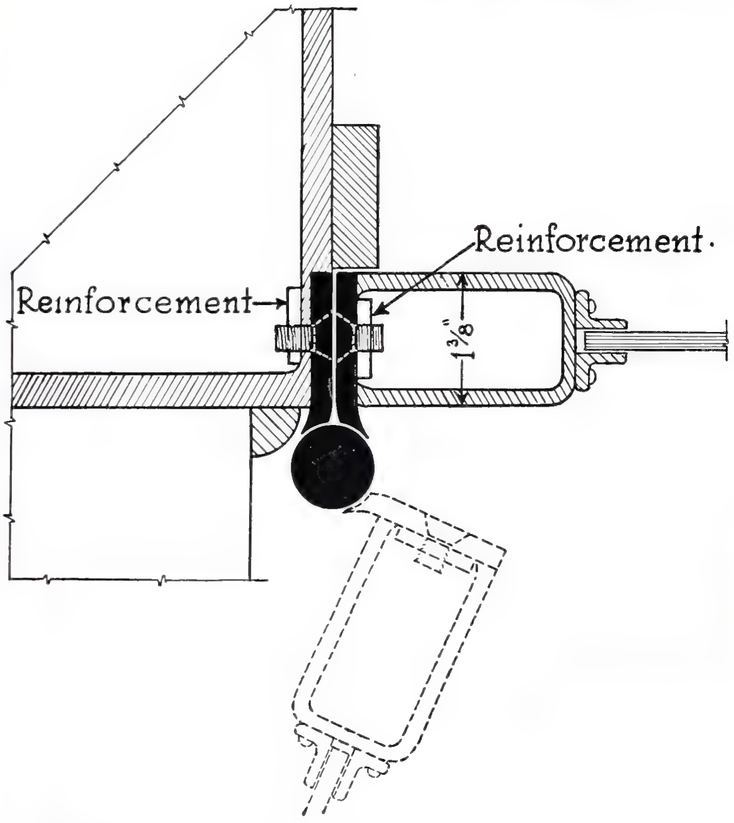
P. & F. CORBIN
SINCE 1849
The American Hardware Corporation, Successor
NEW BRITAIN CONNECTICUT
NEW YORK CHICAGO PHILADELPHIA



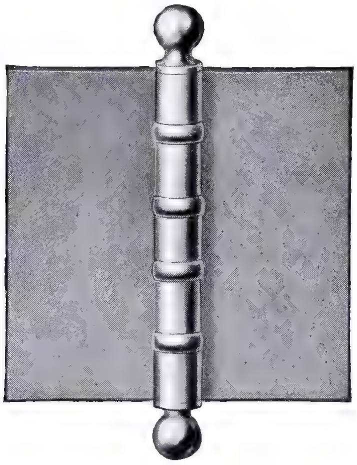
No. 4 of a Series of

STANLEY

Specifications on BALL BEARING BUTTS



No. 851
Scale: ½ size
6" x 4" butt on 1⅜" iron and glass door with iron or steel jamb.



DATA:

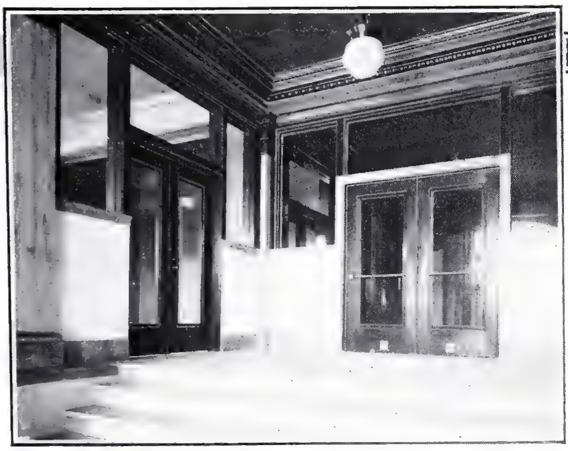
Built for unusually heavy work, this butt is recommended for heavy iron doors. Made of cold rolled steel, without holes. Leaves can be cut off to suit special requirements. It is equipped with four Stanley non-detachable, weather-protected ball bearing washers. Loose pin has the Stanley non-rising and self-lubricating features. Inner edges beveled. Corners are square. Edges of leaves are clean and even. Stanley Sherardized finish is recommended for exterior use. The class number (851) is stamped upon the back of leaf near joint.

Made in following sizes:
6" x 4"
6" x 5"
6" x 6"
6" x 7"
6" x 8"
8" x 8"
7" x 6"
7" x 7"
7" x 8"
7" x 10"
8" x 6"
8" x 10"

We showed specifications on BB239, BB252 and BB170 in previous issues of this publication. Will gladly forward them, if you wish to keep series complete.

STANLEY S.W.

THE STANLEY WORKS
New Britain, Conn.
New York Chicago San Francisco Los Angeles Seattle
Manufacturers of Wrought Hardware and Carpenters' Tools



FIREPROOF?

Yes. The construction of the building is backed with Hollow Metal Doors.

ILLUSTRATION OF HENDRICKS COUNTY COURT HOUSE, DANVILLE, IND.
Clarence Martindale, Architect

DAHLSTROM METALLIC DOOR COMPANY
425 Buffalo Street Jamestown, N. Y.

NEW YORK OFFICE
25 Broadway

DETROIT OFFICE
1331 Dime Bank Building

CHICAGO OFFICE
19 So. LaSalle Street

Representatives in All Principal Cities

TRADE SIMCORE MARK TRADE SIMCORE MARK

Rubber Covered Wires and Cables

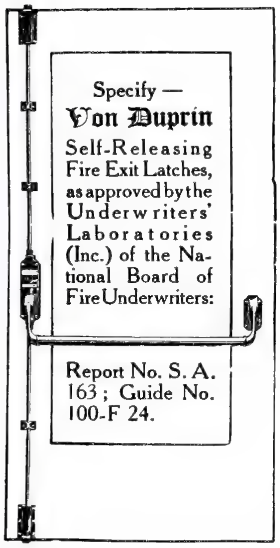
National Electrical Code Standard

Complete detail specifications for your files upon request.
Ask for Simcore Specifications No. 2053.

SIMPLEX WIRE & CABLE Co
MANUFACTURERS
201 DEVONSHIRE ST., BOSTON 9
15 SOUTH DESPLAINES ST., CHICAGO
612 HOWARD ST., SAN FRANCISCO

Von Duprin

Self-Releasing Fire Exit Latches



Specify —
Von Duprin
Self-Releasing Fire Exit Latches, as approved by the Underwriters' Laboratories (Inc.) of the National Board of Fire Underwriters:

Report No. S. A. 163; Guide No. 100-F 24.

As Good As It Looks

Will that schoolhouse, that theatre, that factory of yours be as good as it looks?

On the outside it seems everything that such a building should be; it has dignity; it looks substantial—and safe.

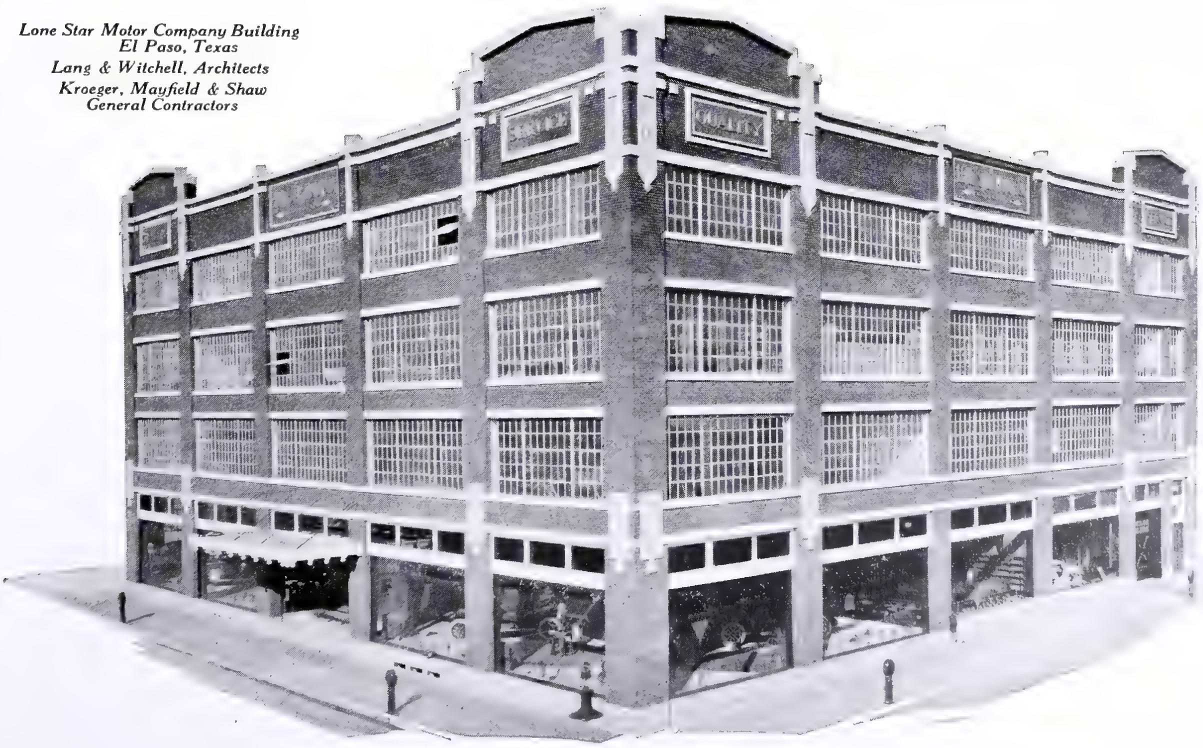
Is it?

No doubt it is fireproof; is it also proof against loss of life and limb through panic?

Install **Von Duprin** Self-Releasing Fire Exit Latches and you will make safe exit certain in time of emergency. A touch of hand or body on a **Von Duprin** instantly opens the way to safety.

Let us send you Catalog 12-F, or see "Sweet's"—pages 1212-1216.

VONNEGUT HARDWARE CO.
Indianapolis, Ind.



Lone Star Motor Company Building
El Paso, Texas
Lang & Witchell, Architects
Kroeger, Mayfield & Shaw
General Contractors

Where Ambler Linabestos Wallboard Meets the need

It has the qualities of permanence and fire-safeness along with attractiveness and convenient use.

Made entirely of the two most indestructible materials—long fibre asbestos and high grade Portland cement—rolled out, with pressure of 3,000 lbs. to the square foot, into a hard, non-warping, non-cracking wallboard of permanent buff color that can be cut with ordinary tools. Made 48 x 48 and 48 x 96 to fit standard joists.

Investigate Linabestos Wallboard for every interior lining use—partitions, wainscoting, hallways, libraries, game rooms, attics, bathrooms, kitchens, etc.

For exterior use—half-timbering, paneling, fire doors, trim, and for interior use where unusual strength is needed, call for Ambler Asbestos Building Lumber.

For a snug-fitting, attractive, thoroughly fireproof roof, use Ambler Asbestos Shingles in the American, French or Honeycomb style.

You may have full information and specimens without obligating yourself.

**ASBESTOS
SHINGLE, SLATE & SHEATHING
COMPANY**

Dept. L AMBLER, PENNA.

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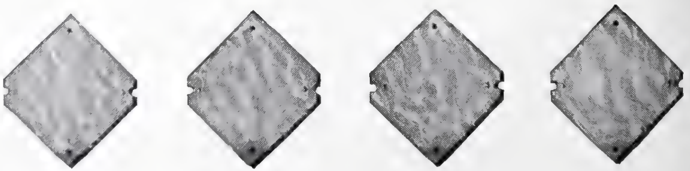

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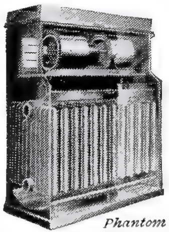
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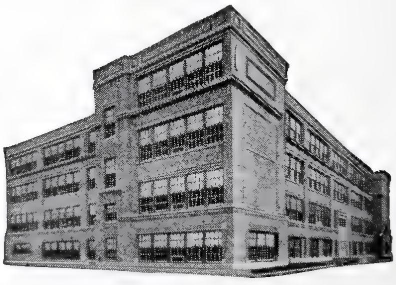
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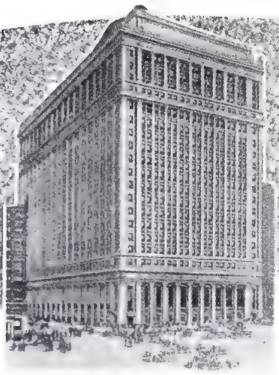

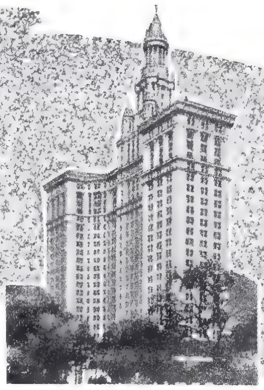

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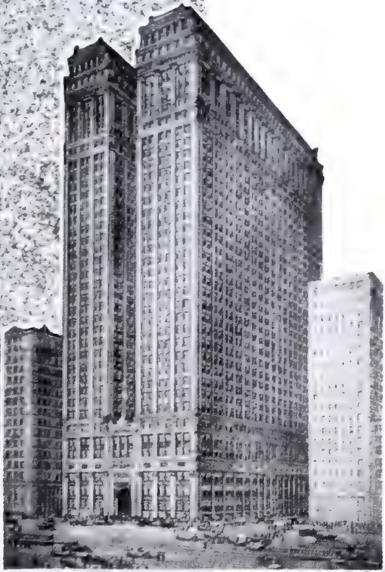

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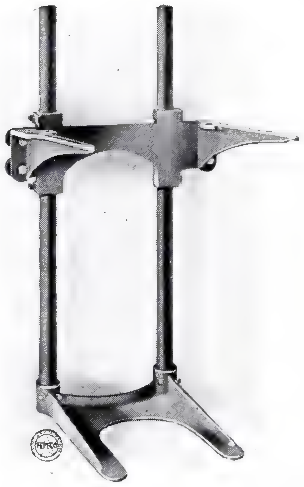

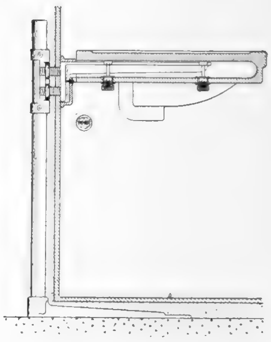

Referring to the detail drawing, it will be seen that the threaded base bolts to which the brackets are bolted assure ample adjustment to provide for any variation in thickness of wall finish after the carrier has been built in.

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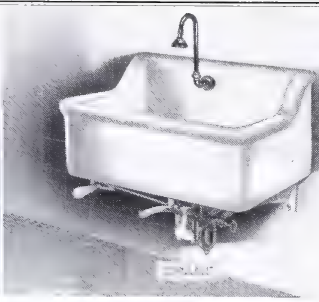

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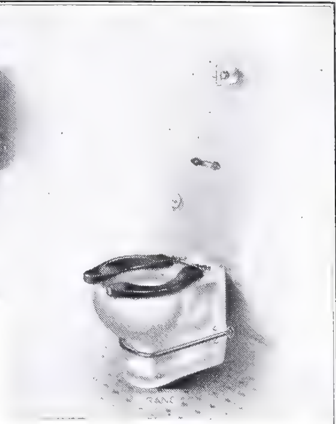

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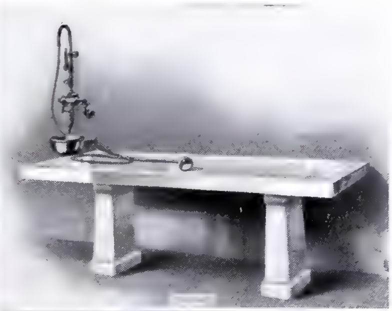

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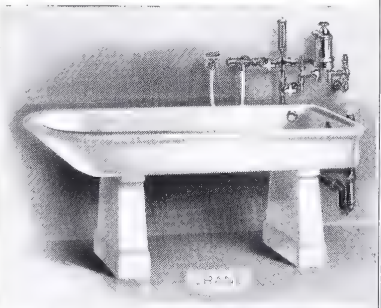

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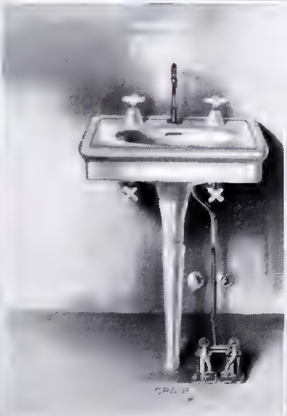

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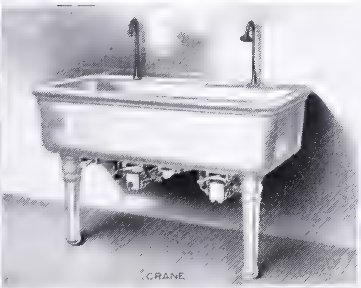

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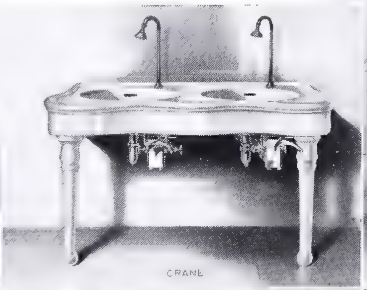

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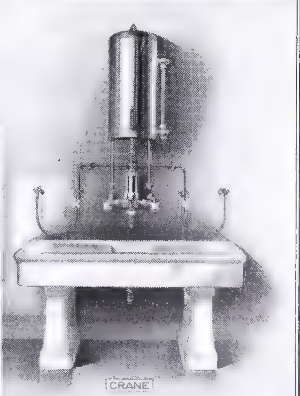

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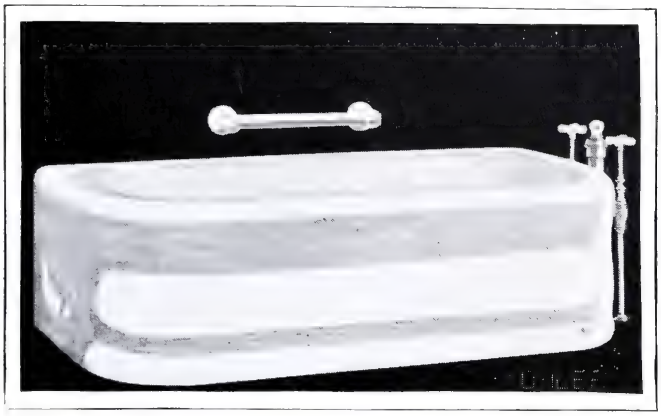
TO Every
TWO Bedrooms



THE ASSET OF A GOOD NAME

In these days when people are seeking more genuine value for their money, the architect finds his professional pride in specifying Kohler Enameled Plumbing Ware greater than ever before.

He finds the quality of Kohler Enameled Plumbing Ware so universally recognized that merely to mention "Kohler" when the prospective builder inquires about plumbing ware, strengthens the confidence of the client in his judgment and experience.

For forty-nine years, the Kohler Co. has been engaged in the manufacture of quality products. Each succeeding year has won a greater recognition for fixtures bearing the "Kohler" name. And today, more than ever, is this asset of a good name scrupulously guarded in all Kohler manufacturing processes.

Every piece of Kohler Ware is exclusively distinguished for (1) the beautiful, snowy whiteness of its durable enamel, (2) the uniformity of this whiteness in every fixture, (3) the name "Kohler," in dainty blue letters, inconspicuously but permanently fused into the enamel for your protection.

The beauty and durability of Kohler Ware has led to its installation in leading hotels, clubs, public institutions, apartments, and in countless thousands of homes both modest and pretentious. Send for illustrated booklet, "KOHLER of KOHLER," which describes Kohler bathtubs, lavatories, kitchen sinks and laundry trays.

Some of the Recent
Kohler
Hotel Installations

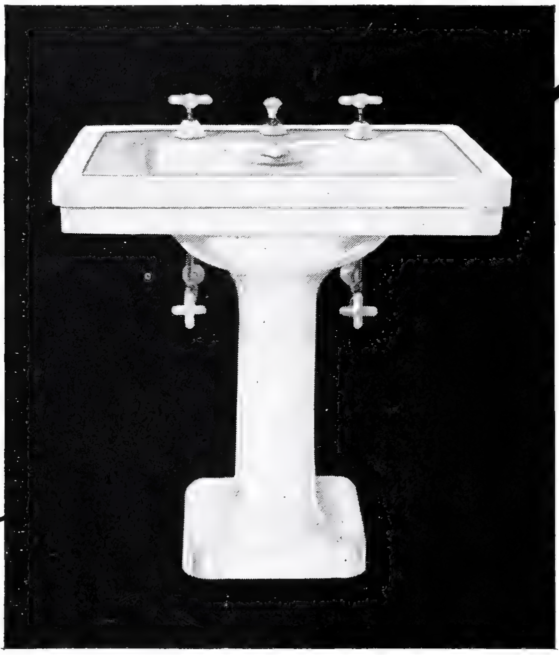
Ambassador Hotel
Los Angeles, Cal.
Ambassador Hotel
Chicago, Ill.
The Drake
Chicago, Ill.
Wolverine Hotel
Detroit, Mich.
Texas Hotel
Dallas, Texas

KOHLER OF KOHLER

Kohler Co., *Founded 1873,* Kohler, Wisconsin, *Shipping Point,* Sheboygan, Wisconsin
BRANCHES IN PRINCIPAL CITIES

MANUFACTURERS OF ENAMELED PLUMBING WARE AND KOHLER AUTOMATIC POWER AND LIGHT 110 VOLT D. C.

The Madbury Lavatory



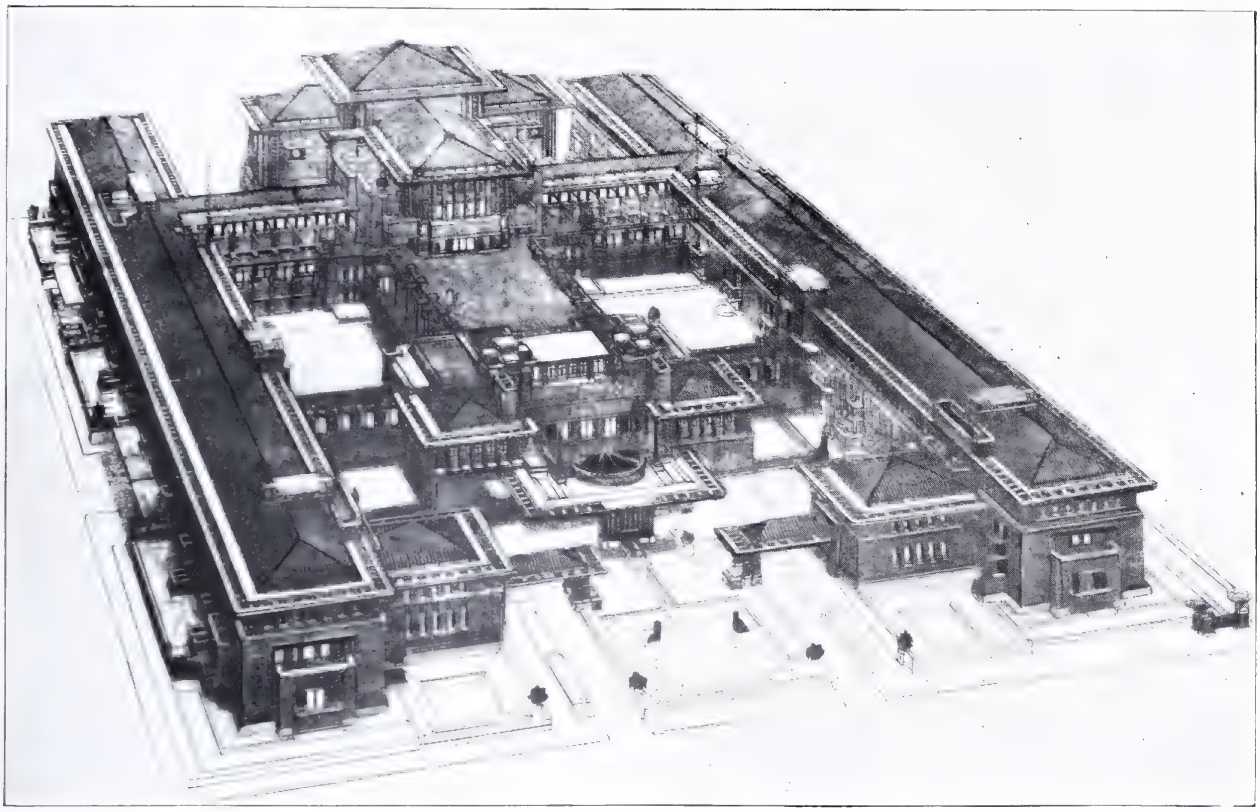
In specifying Thomas Maddock plumbing equipment one has the assurance that the high quality of the fixtures is backed by the experience of the "Oldest Sanitary Potters in America."

The pedestal lavatory shown above is a one-piece vitreous china fixture. Valve handles and other slab fittings also are made of china. And, being made with an integral supply nozzle and overflow cleansing device, this fixture unquestionably represents the highest ideals in the development of the lavatory.

MADDOCK

THOMAS MADDOCK'S SONS CO., TRENTON, N. J., U. S. A.

THE BRUNSWICK-BALKE-COLLENDER CO.
WHALE-BONE-ITE
REG. PAT. OFFICE
CLOSET SEATS

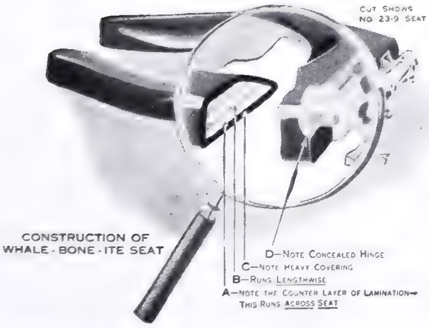


IMPERIAL HOTEL, Tokyo, Japan Covers an area of 400 feet wide by 600 feet long, 4 and 6 story

Frank Lloyd Wright, Architect H. A. Durr & Co. Engineers

Whale-Bone-Ite

was selected to equip this hotel thruout,
because the architects and engineers knew from
years of experience with it that it was the only seat to use.
They had to be doubly sure account of great cost
to transport same to the job.


CUT SHOWS NO. 23-9 SEAT
CONSTRUCTION OF WHALE-BONE-ITE SEAT
D—NOTE CONCEALED HINGE
C—NOTE HEAVY COVERING
B—RUNS LENGTHWISE
A—NOTE THE COUNTER LAYER OF LAMINATION→ THIS RUNS ACROSS SEAT

TRULY FIRST COST—LAST COST

An international product, substantiating in service
our claims of satisfactory sanitary service—
Impervious, acid-proof and easiest cleaned.

Sold by All Leading Plumbers and Jobbers

MADE BY

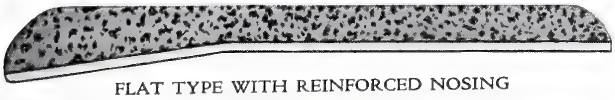
THE BRUNSWICK-BALKE-COLLENDER CO.
623 SO. WABASH AVE. CHICAGO

UNIVERSAL
Anti-Slip Metal Tread

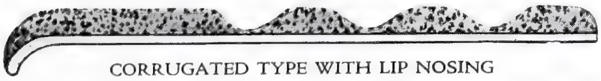
IN this tread, preferred by some architects because of the absence of metal ribs, the entire wear surface is composed of "Alundum," a granular abrasive and the hardest mineral known.

The nosings, which get the brunt of the wear, are usually reinforced to about twice the thickness of the body, which practically doubles the life of the tread.

The steel base plate is thoroughly lead coated, making the tread absolutely *rust proof*.



FLAT TYPE WITH REINFORCED NOSING



CORRUGATED TYPE WITH LIP NOSING

We will gladly send without obligation a sample section if you wish to judge the merits of this tread by actual inspection.

Universal Safety Tread Co.
40 Court St., Boston, Mass.

Super-Smokeless Boilers Use The Bunsen Burner Idea

Super-Smokeless Boilers admit fresh, heated air right at the heart of the fire. The additional oxygen produces an intensely hot, blue-white flame of remarkable heating capacity. Cheap soft coal can be used, as the smoke and combustible gases are efficiently consumed. Descriptive catalogue and list of installations upon request.

Utica Heater Company
UTICA, N.Y.
218-220 W. Kinzie St., Chicago, Ill.
Branches in Principal Cities

A True Mark of Thoughtful Planning

FOREMOST among those unseen details of construction, that give to the homes planned by some architects added comfort and convenience, is the Kernerator—the modern system for disposing of household waste.

The Kernerator consists of a brick incinerator, built into the base of the chimney when the house is erected, and a hopper door located in the flue on the first floor. It takes care of all household refuse—rags, sweepings, wilted flowers, broken crockery, tin cans, garbage—*without cost*, for no commercial fuel is required. Non-combustibles are dried and sterilized and later dropped into the ashpit.

Drop All Waste Here—Then Forget It

For complete information see page 1906, Sweet's 1921 Catalog

Kerner Incinerator Company
1015 Chestnut St., Milwaukee, Wis.

KERNERATOR
Built-in-the-Chimney

Selecting the Fan Equipment

PERHAPS, no equipment installed in public buildings is of greater importance than the fan apparatus. Upon the successful operation of the fan system depends, to a marked degree, the health and comfort of many.

In order to best protect the interests of their clients, a large number of architects and heating and ventilating engineers are selecting Clarage Kalamazoo Multiblade Fans. Not only are the Multiblade Fans chosen because of large capacity, low speed and economy of operation, but because, above everything else, this equipment is indeed dependable. Actual installation records bear evidence of this fact.

Is it not possible for you to investigate the merits of our equipment? We will be very glad to send you our latest catalog or to have a Clarage engineer call at your convenience.

CLARAGE FAN COMPANY

New York Philadelphia Minneapolis Los Angeles Chicago Detroit Boston Indianapolis Cleveland Pittsburgh St. Louis

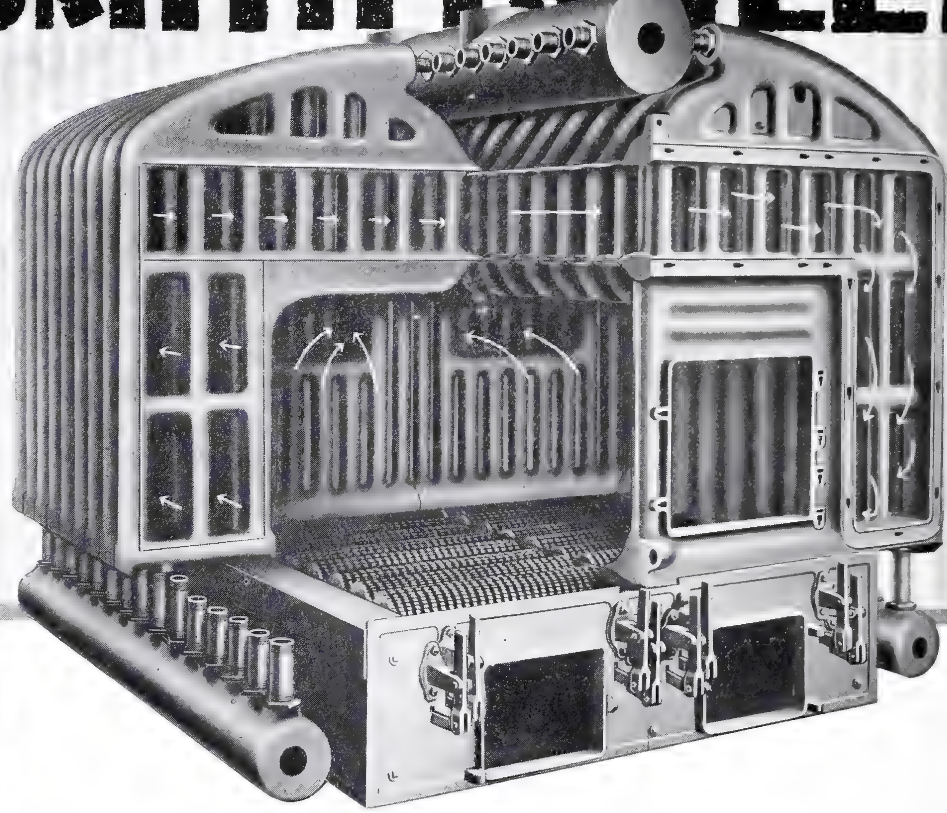
Main Office and Factory, KALAMAZOO, MICHIGAN

CHICOPEE HIGH SCHOOL
CHICOPEE, MASS.
Equipped throughout with Clarage Apparatus

Architect—George E. Haynes, Pittsfield, Mass.
Heat. and Vent. Contractor—
Gavin & Moriarty, Willimansett, Mass.

CLARAGE
—KALAMAZOO
Multiblade Fans

The SMITH BOILER



No. 60 SMITH BOILER

With Smokeless Furnace

A BOILER of scientific and individual design for burning all fuels such as bituminous coal, anthracite coal, lignites, coke, oil and wood in conformity with city smoke ordinances.

Single tier grate design requires a minimum amount of attention, eliminates elaborate firing methods and thus insures efficient results under all conditions of operation.

Combustion chamber with ignition aperture provides for complete combustion of gases, thus preventing smoke and resulting in high efficiency and marked economy of operation.

You can afford to replace your present boiler with a 60 Smith, for the economy of a Smith boiler with Smokeless Furnace will pay for such an installation in a few years.

THE H. B. SMITH CO.

Sales Offices and Warehouses:

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PHILADELPHIA, PA.

Residence of Ruben H. Rossman
Jackson, Mich.

Claire Allen, *Architect*

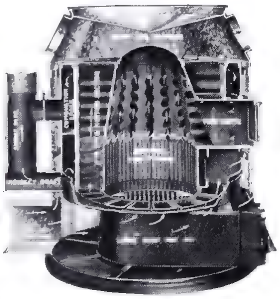
Why Kelsey Health Heat Is Ideal for the Home

Warm, Fresh Air
The Kelsey Warm Air Generator supplies every room in the house with large volumes of fresh, warm (not hot) air, regardless of weather conditions. A special cap in the warm air chamber sends an extra amount to the room that is hard to heat.

Circulation
The warm air is delivered not only in large volumes but at high velocity, insuring proper circulation.

Ventilation
The air is kept pure by the removal of the used air through vents at the floor line.

Humidity
The Automatic Humidifier supplies the right amount of moisture for health and comfort. Humidified air at 68° feels warmer than dry air at 72°, and preserves floors and furniture from drying out and pulling apart.



Convenience
With inconspicuous registers in the floors or side walls, every part of the floor space is available for convenient and artistic arrangement of furniture. There are no unsightly and obtrusive radiators taking up valuable space.

Economy
Kelsey economy is a well established fact. Inspection of a Kelsey Warm Air Generator will show you why its unusual heating surfaces produce more heat to the ton than any other system.

Our Engineering Department will prepare estimates and detailed plans that insure a satisfactory installation. Send for Booklet No. 5 for further information.

NEW YORK OFFICE
565–F Fifth Ave.
(Corner 46th Street)

THE KELSEY
WARM AIR GENERATOR
(Trade Mark Registered)
251 James Street, Syracuse, N. Y.

BOSTON (9) OFFICE
405–F P. O. Sq. Bldg.

Trade Mark **KELSEY HEALTH HEAT** Registered

Group of six store buildings with roofgarden overhead, Saginaw, Mich. Each has its individual Adsco Heating System

Masonic Temple, Weston, W. Va. Adsco Heating was used with individual boiler plant

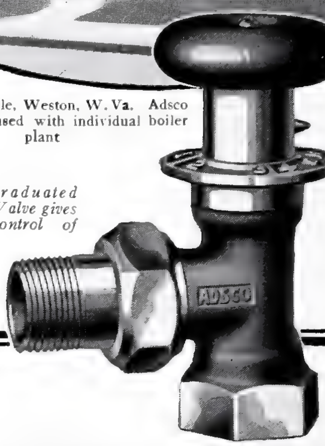
To Secure Positive Heat Control Assures Fuel Economy

ADSCO Heating accomplishes the two prime requisites of a heating system: comfort and economy. The positive control of the steam at each radiator by the Adsco Graduated Radiator Valve makes overheating unnecessary. As little or as much of the radiator's surface may be used as needed to heat the room comfortably. Saves 20% to 30% fuel costs.

Vented to the atmosphere—no noise. Pressure maintained constant by Adsco Damper Regulator. Installation cost low because air valves, traps, vacuum pumps not needed. Adsco Heating specialties are used with all makes of boilers.

Write for Bulletin No. 159-AF for technical data describing Adsco Heating; also tells how to change hot water systems. Ask for Bulletin No. 158-AF for individual boiler installation; Bulletin 20-AF on Adsco Community Heating of building groups from Central Station Steam Plant.

AMERICAN DISTRICT STEAM COMPANY
GENERAL OFFICES AND WORKS
NORTH TONAWANDA, N.Y.
Offices: First National Bank Bldg., Chicago; 1544 Woolworth Bldg., New York; Hoge Bldg., Seattle; 1404 Arrott Bldg., Pittsburgh, Pa.



Adsco Graduated Radiator Valve gives positive control of steam.

ADSCO HEATING

HESS WHITE STEEL

Medicine Cabinets and Lavatory Mirrors

meet the demand for better-than-wood cabinets and wood-framed mirrors, and at reasonable prices.

The highest grades of materials and workmanship go into these goods—polished plate glass mirrors, nickeled brass hardware, steel or glass shelves, and the whole, inside and out, finished in beautiful baked white enamel, guaranteed to be everlasting.

Look for this mark:

HESS
TRADE-MARK
CHICAGO

and make sure you are getting the genuine Hess.

Sold by Dealers everywhere

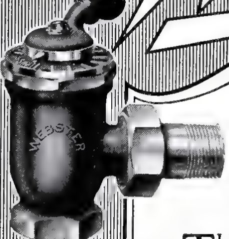
Illustrated booklet on request

Sweet's Index, page 1470

Hess Warming & Ventilating Co.
1216 Tacoma Building, Chicago

Makers of Hess Welded Steel Furnaces

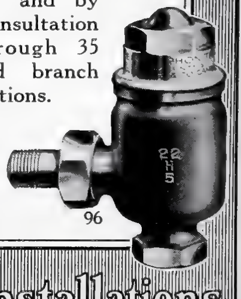
The Webster



SYSTEMS OF STEAM HEATING

THE engineer who uses Webster equipment is assured of permanent satisfaction by the Webster experience of 33 years, by the well-known mechanical excellence of Webster apparatus, by the records of over 17,000 Webster Heating System installations, and by the Webster free consultation service offered through 35 conveniently located branch offices and service stations.

Send for Bulletins
WARREN WEBSTER & CO.
Camden, N. J.
Branches in 31 Cities



96

More than 17,000 installations

Sturtevant

REG. U.S. PAT. OFF.

PUTS AIR TO WORK

On the Pacific

THIS handsome, twelve-story building is yet another example wherein a Sturtevant system is installed.

From coast to coast, architects of hundreds of the most representative and modern buildings are gratified with the results obtained from

Sturtevant Ventilating Fans

The specialists who cooperated in these successful installations are always at your service to cooperate with you.

A call on the sales office nearest you will put you in direct touch with our Heating and Ventilating Engineers.

PACIFIC MUTUAL BUILDING, LOS ANGELES, CALIF.
Architects, Dodd & Richards *Heating Contractors,* Illinois Engineering Co.

B. F. STURTEVANT COMPANY

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SALT LAKE CITY, UTAH
818 McIntyre Bldg.
SAN FRANCISCO, CALIF.
759 Monadnock Bldg.
SEATTLE, WASH.
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WASHINGTON, D. C.
1006 Loan & Trust Bldg.
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OF CANADA, LTD.
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404 New Birks Bldg.
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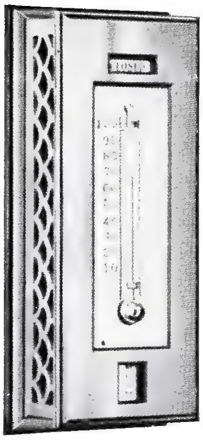
- JOHNSON - JSC - SYSTEM -

Inconspicuous, Artistic and Effective



The Johnson "All-Metal" Thermostat

(Size 4¾″ x 2″ x 1″)

Catalogs will be mailed on request

Assures freedom from the mechanical troubles which always develop with ordinary thermostats containing rubber diaphragms. There are no rubber parts to wear out in the Johnson "All-Metal" Thermostat, which is an important unit in the Johnson System of Temperature Regulation.

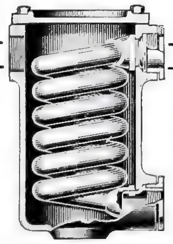
Wherever the Johnson System has been installed, it has proved its worth. It does away with unhealthy extremes of heat and cold in any building, automatically regulating the temperature of each room it serves. The Johnson Thermostat is compact, inconspicuous and artistic.

Johnson Service Company
Milwaukee, Wis.

TEMPERATURE JSC REGULATION

HOT WATER

At Lowest Possible Cost



Sectional View

Specify the EXCELSO

Because it guarantees ***constant supply*** of hot water without cost for extra fuel—and because it does away with firepot coils.

Connects on ***outside*** of any steam or vapor heating boiler.

Endorsed and SOLD by the following boiler manufacturers:

American Radiator Co.
Richardson & Boynton Co.
Richmond Radiator Corp.
Standard Heater Co.
Utica Heater Co.
Burnham Boiler Corp.
Pierce, Butler & Pierce Mfg. Co.
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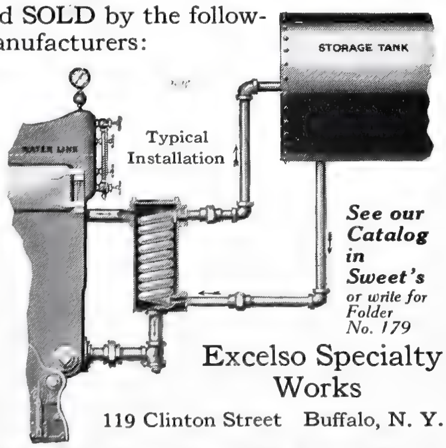
The Wm. H. Page Boiler Co.
Gurney Heater Mfg. Co.
Thatcher Furnace Co.
Abendroth Bros.
Also by plumbing supply jobbers everywhere

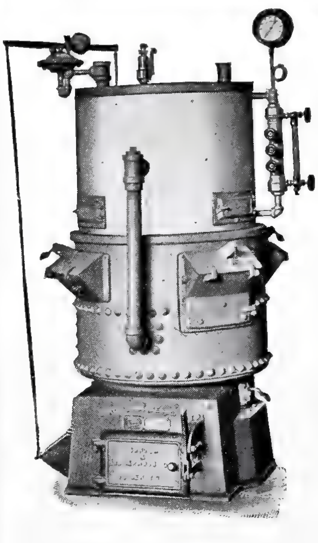


Typical Installation

See our Catalog in Sweet's
or write for Folder No. 179

Excelso Specialty Works
119 Clinton Street Buffalo, N. Y.

EXCELSO WATER HEATER



Durability

of the **Gorton Self-Feeding Boiler** is demonstrated by the fact that many of the boilers installed over 25 years ago are still in use giving entire satisfaction.

Efficiency

The **Gorton Self-Feeding Boilers** are built on the lines of Power Boilers, using the same material, thus securing the greatest Strength, Durability, and highest Efficiency.

The **Gorton Self-Feeding Boiler** gives a steady heat with attention only morning and night; its construction insures complete combustion of the gases and prevents the waste of coal.

See pages 2, 3, 4, 6, 8, 10, 11, and 13 of Catalog No. 88.

OUR NEW NO. 88 CATALOG IS READY—WILL BE SENT UPON REQUEST

Gorton & Lidgerwood Co.
96 Liberty Street, New York

All Gorton Self-Feeding Boilers built to the "A. S. M. E. Standard"

From a painting by Adolph Treidler. © ARCO 1922
Architect: Aymar Embury, 2nd

An amazing saving in fuel

A hundred and thirty tons of coal were used to heat this beautiful home of Mr. Louis H. Porter, Stamford, Conn., in the winter of 1916-17.

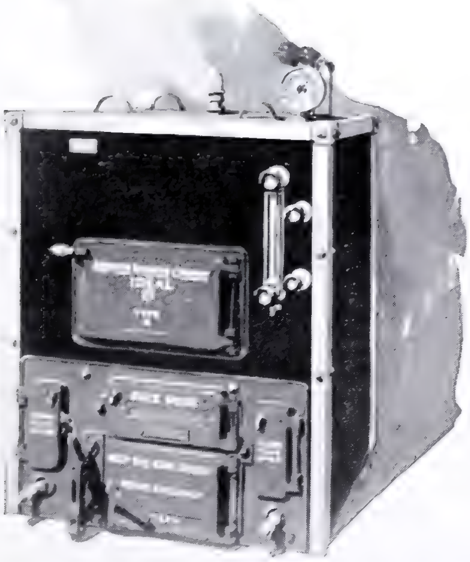
The following summer Mr. Porter had the old-fashioned, wasteful heating equipment taken out of his cellar, and two Ideal TYPE A Heat Machines installed.

In the winter of 1917-18, a hard winter, 76 tons were burned.

In the winter of 1918-19, a mild winter, 58 tons were burned.

There are many, many home owners who are paying a tremendous price for the extravagance of old-fashioned heat. We claim for the Ideal TYPE A Heat Machine an average fuel saving of one-third; Mr. Porter, and many other owners, have found that the claim is much too modest.

To Architects or Engineers who will have residences or small buildings under way this Spring: Your name on your letterhead, sent to either address below, will bring a finely illustrated book of the Ideal TYPE A Heat Machine showing heat test charts and details of construction.



AMERICAN RADIATOR COMPANY

IDEAL Boilers and AMERICAN Radiators for every heating need

104 West 42nd Street **Dept. 117** **816 So. Michigan Ave.**
NEW YORK CHICAGO

Lord & Taylor, Fifth Avenue, New York

Starrett & Van Vleck, Architects

Frink Lighting
for Stores

The architect handling a store problem will find a firm ally in the Frink Engineering Department.

We know that proper illumination is not only a matter of efficiency but one of the best advertisements the store can have. The Frink System is based on an intimate knowledge of the very varying needs of each department. It covers general illumination, also units for galleries, show cases and windows.

Frink System of Synthetic Lighting

applied to show windows puts at the disposal of the window dresser attention-compelling color effects comparable only to those of the stage. It is used by such stores as:

James McCreery & Co.
Lord & Taylor
R. H. Macy Co.
Abraham & Straus

Catalog 424 describes in detail the Frink Lighting System for stores and should be in every architect's library.

I. P. FRINK, Inc.

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A-2

Plates of Colonial Architecture

Measured Drawings and Photographic Illustrations

Contained in three paper bound books published in recent years from specially made photographs and drawings. They were originally sold at $1.00 each, but a limited number now available are priced at 50 cents each. They are of practical value to anyone interested in Colonial work. The subjects are as follows:

Interiors of Old Houses in Salem and Vicinity

Contains twenty-five full-page photographic illustrations of details selected from the finest old houses of this district, showing many of the exquisite mantels, stairways, etc., designed by Samuel McIntyre that are so justly famous.

Old Colonial Brick Houses of New England

Twelve typical New England houses are shown in full-page photographic illustrations and measured drawings of the front elevations. The exquisite proportion and fenestration are easily made available through these plates.

Twelve Old Houses West of Chesapeake Bay

This book shows a selection of the best smaller houses along the Virginia rivers. Particularly valuable in illustrating the picturesque dormers, roof lines and chimneys characteristic of this region. Illustrations and measured drawings.

Bound in paper covers, printed on one side of the sheet only, size 8 x 10½ inches. Sent postpaid to any address in the United States upon receipt of price. 50 cents per copy.

Rogers and Manson Company

Architectural Publishers

142 Berkeley Street, Boston 17, Mass.

On Remodeling Jobs

THE old heating plant is often inadequate for additions. In such cases, CLOW GASTEAM, as a doctor would say, is indicated.

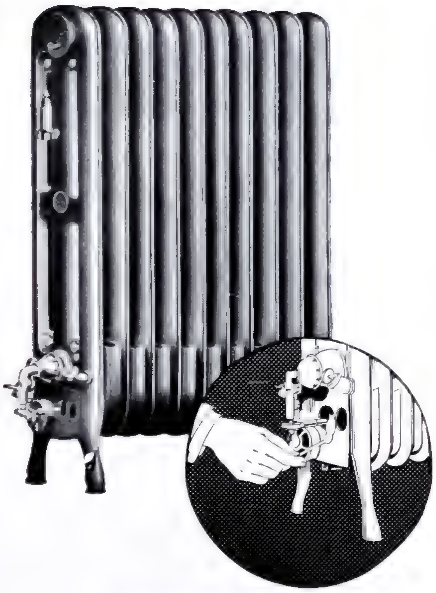
CLOW GASTEAM radiators can be quickly installed in any type of structure—new or old. They provide a real steam heat, of pleasing and healthful humidity. They are very economical in operation, with a cleanliness and convenience impossible to secure with any other form of heating. They require no attention, have nothing to get out of order, and will last indefinitely.

A surprising number of architects specify CLOW GASTEAM on every job—either as the sole means of heat, or supplemental to other systems. The elasticity of CLOW GASTEAM is one of its virtues.

CLOW GASTEAM is successfully used all over the country, in all kinds of buildings—residences, stores, offices, factories, schools, churches, theatres, etc. We will be glad to give you a list of CLOW GASTEAM installations in your vicinity.

The name of Clow has long been synonymous with superlative plumbing equipment. In the allied field of heating, it represents the same ideals of careful design and perfect workmanship.

Is the CLOW GASTEAM Handbook for Architects in your files?



JAMES B. CLOW & SONS
General Offices: 534-546 S. Franklin Street, Chicago
Sales offices in the principal cities

CLOW

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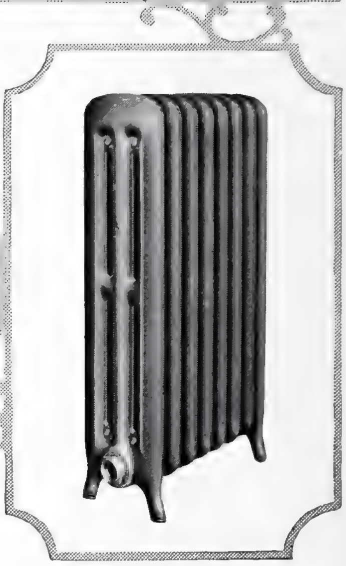
Atlantic City



New York City

United States Radiators

Heat these Ambassador Hotels

United States Radiator Corporation

GENERAL OFFICES: DETROIT, MICHIGAN

Branch Offices in Principal Cities

TRADE
JENKINS
MARK

This committee of correction assures valve perfection—

An elaborate system of inspection and test is in force in Jenkins factories.

Every valve and all its parts are subjected to rigid examinations of inspectors and testers who constantly operate in every department.

Should any part fail, in even the slightest degree, to measure to the high standard set, it is not used; but is rejected and referred to the "Committee of Correction," which is composed of department superintendents, chief inspector and the metallurgist.

However, this committee which is called into daily conference is but one precaution exercised to maintain the high standard for which Jenkins Valves are so well known. Others are: correct design and proportion; ingredient metals that analyze pure; uniform castings; careful machining; accurate assembly; wide margin tests, and handsome finishing.

Jenkins Valves are made for all requirements. Each is guaranteed for the maximum service, not merely the average. The signature and Jenkins "Diamond" identify the genuine at supply houses everywhere.

Send for data on valves for any service

JENKINS BROS.
New York Boston Philadelphia Chicago
Montreal London Havana
FACTORIES: Bridgeport, Conn.;
Elizabeth, N. J.; Montreal, Canada

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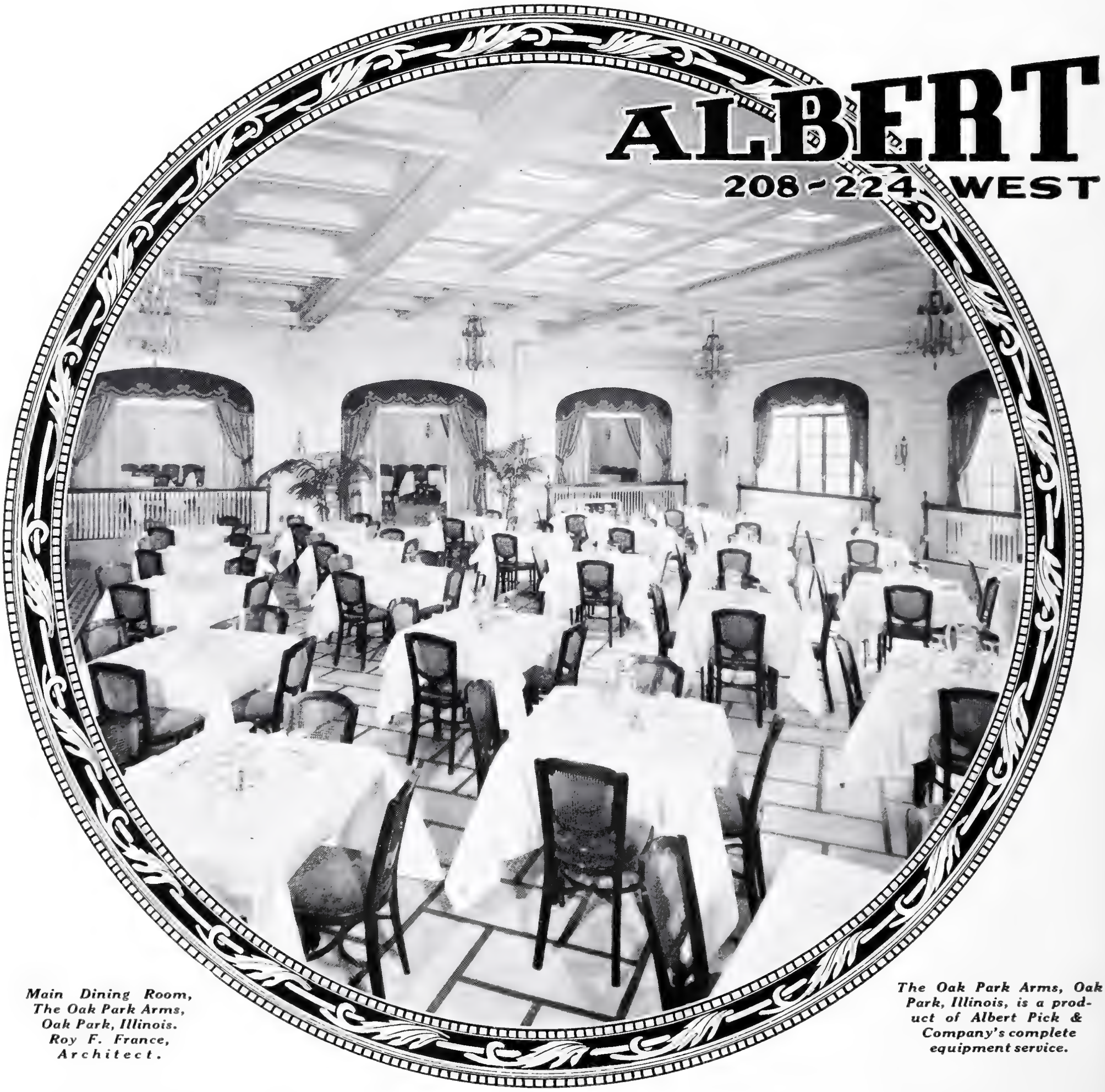

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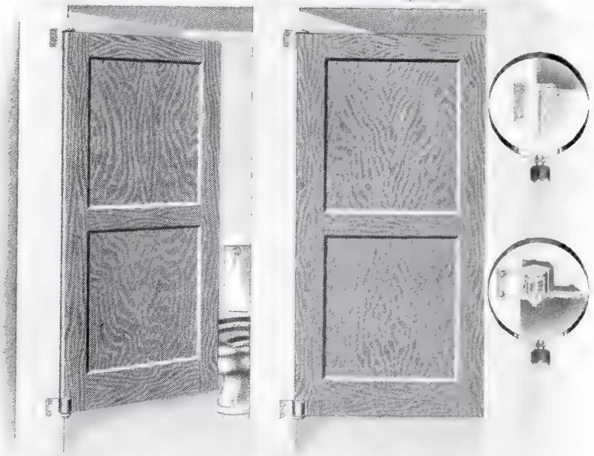

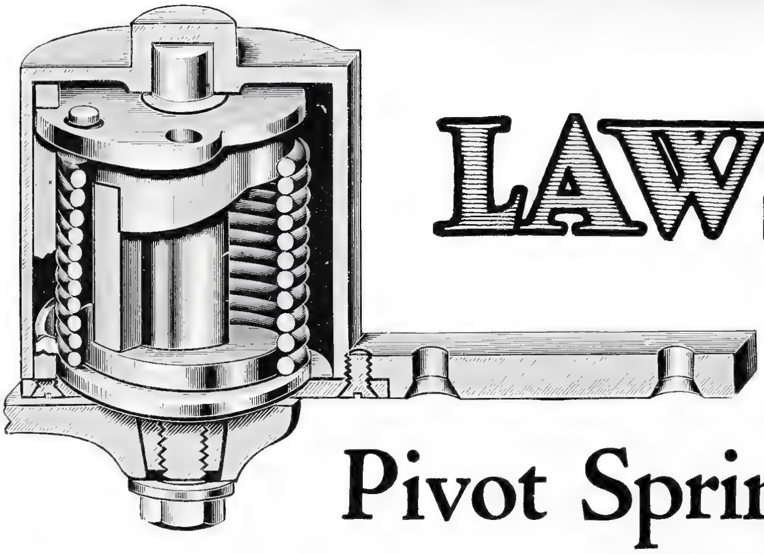

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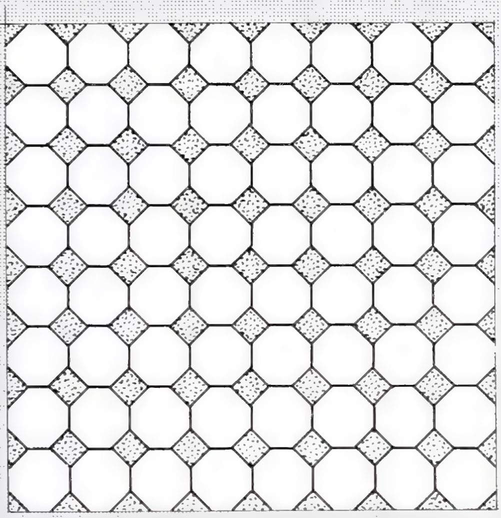

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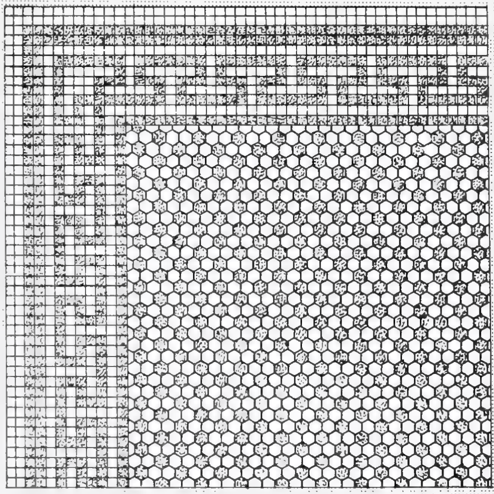

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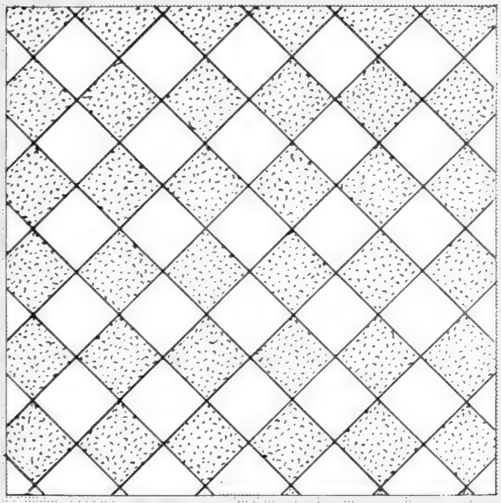

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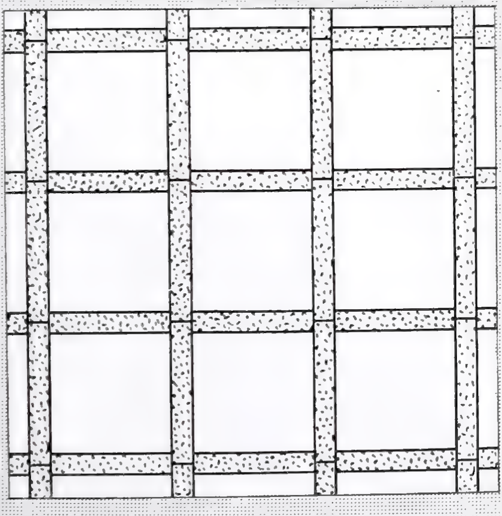

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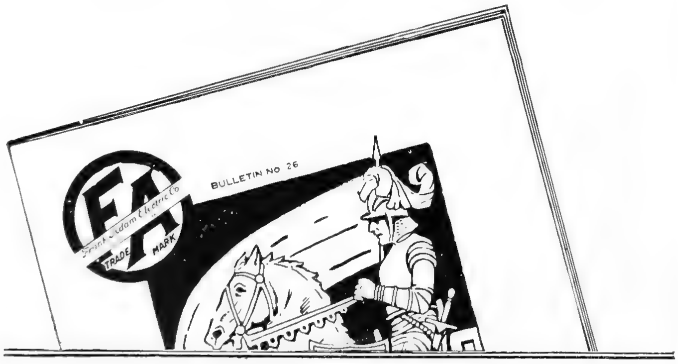

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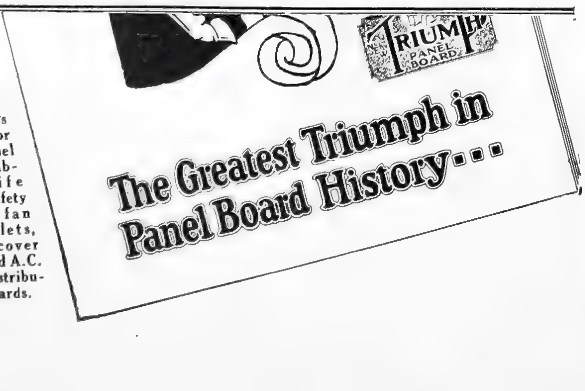
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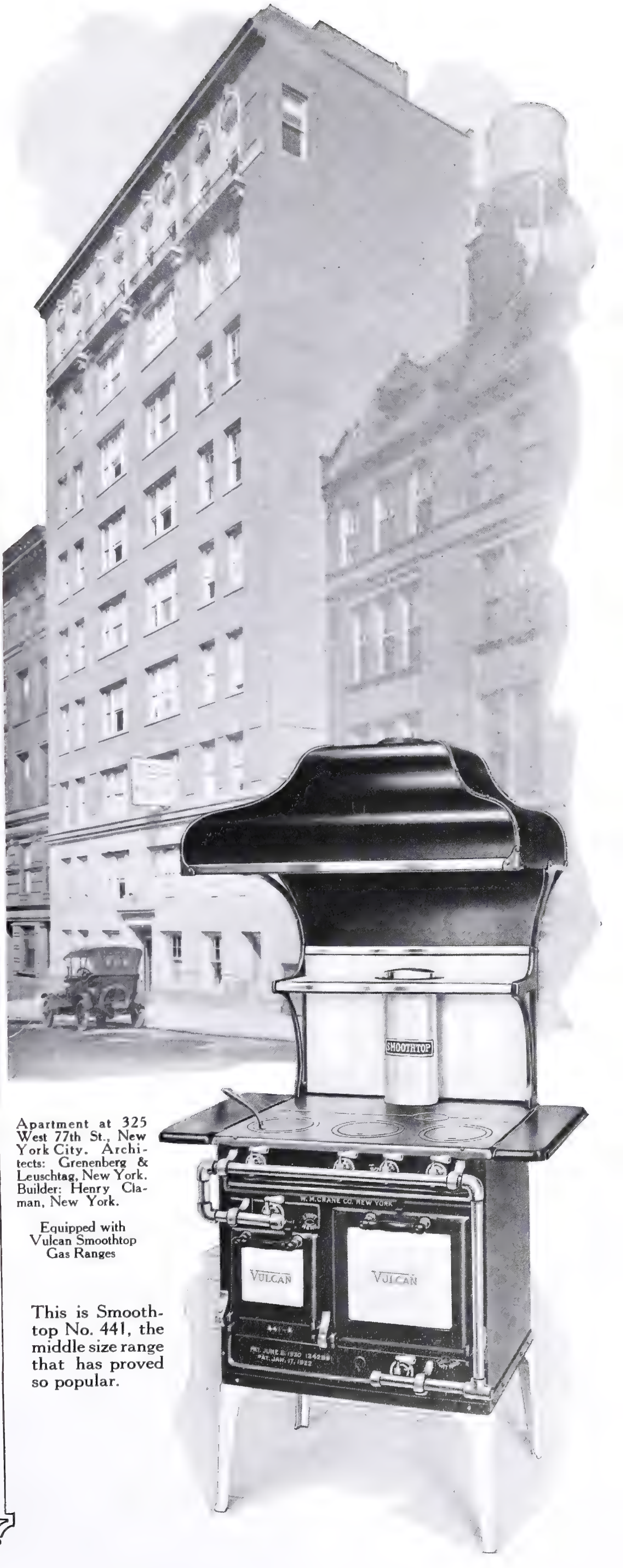

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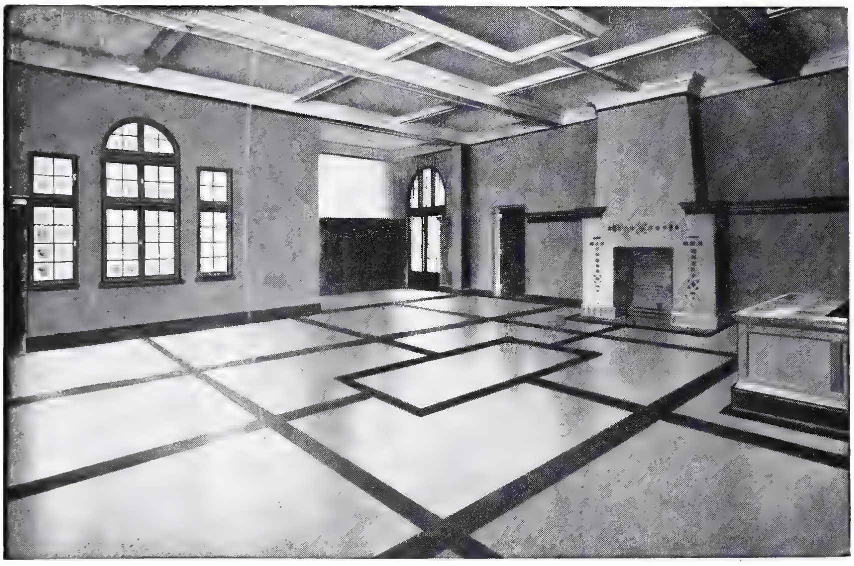

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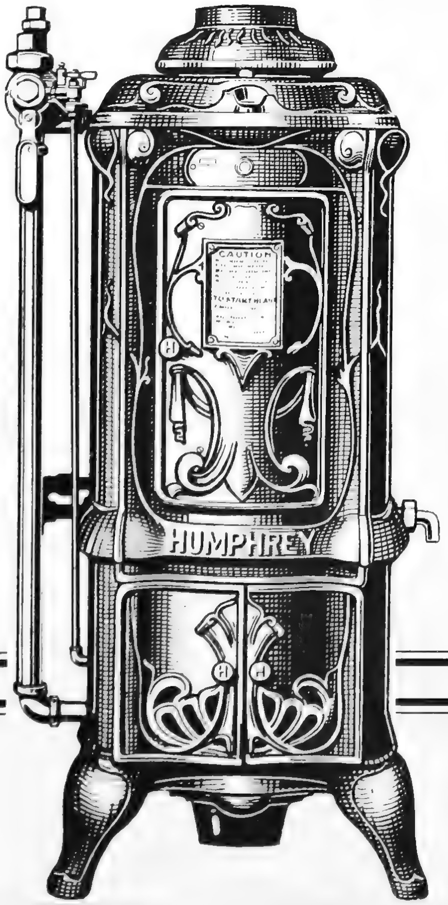

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CATALOG REVIEW

Skinner Organ Co., Boston. "The Skinner Organ," a portfolio of views of interiors of different kinds in which Skinner organs have been installed.

The production of pipe organs differs materially from that of most other equipment entering into buildings. Since each installation is a separate and distinct problem, no hard and fast rules for their making can be formulated, and this publication aims at presenting to architects and prospective clients only such information as will be generally helpful. Architects are frequently at fault in providing for organ spaces which are not well suited to the purpose, a mistake not always recognized until it is too late to correct it, but which sometimes results in injuring the effectiveness of the organ's use. A properly built pipe organ requires suitable space, correctly disposed for the purpose, added to which atmospheric and other conditions necessary to the welfare of the instrument must be satisfied. Without being in any sense a technical treatise on organ building or even on the use of organs, this publication offers information which architects would do well to obtain.

ANNOUNCEMENTS

Giaver, Dinkelberg & Ellington announce the removal of their offices from the Book Building to 1507 Stroh Building, Detroit. Manufacturers' catalogs requested.

Beacham & LeGrand, architects, announce that after March 1 their offices will be located at 211 Bruce Building, North street, Greenville, S. C.

Frank Irving Cooper Corporation, architects and engineers, announce the removal of their office from 33 Cornhill to 172 Tremont street, Boston.

Nichols, Sheppard & Colthurst, architects and engineers, are now located in their new offices, Dowler Building, Sandwich street, W., Windsor, Canada.

The Van Tanner Building Co., 116 West 39th street, New York City, have been recently organized for the purpose of constructing suburban homes in all the nearby boroughs and in the State of New Jersey, and are desirous of obtaining all manufacturers' literature pertaining to materials and equipment used in the modern home.

Samuel Hannaford & Sons announce the removal of their office from the Hulbert Block to the 10th floor, Dixie-Terminal Bldg., Cincinnati, Ohio.

Adden & Parker, architects, announce the removal of their offices March 1 to 177 State street, Boston.

Byron E. Porter has opened an office for the practice of architecture at Room 1119, Tremont Bldg., Boston. Manufacturers' samples and catalogs requested.

Warren & Knight, architects, announce that after January 1, 1922, John Eayres Davis, formerly practising architect of Detroit, Mich., will become a member of the firm. The new firm name to be Warren, Knight & Davis, architects, with offices at 1607–22 Empire Bldg., Birmingham, Ala.

The Kenneth H. Gedney Company, architects and engineers, announce the opening of their office in the Loyal Mystic Legion Bldg., Hastings, Neb. Manufacturers' samples and catalogs requested.

Silverstein & Infanger, 188–190 Montague street, Brooklyn, N. Y., are desirous of receiving manufacturers' samples and catalogs.

Hein & Hauskey, architects and engineers, announce the removal of their offices to larger quarters on the 4th floor of the Builders Exchange, Minneapolis, Minn.

George E. Trent announces the opening of an office for the practice of architecture at 613½ Ninth street, Huntington, W. Va. Manufacturers' catalogs and samples desired.

CORRECTIONS

In the advertisement of the Carter Bloxonend Flooring Company, Kansas City, Mo., appearing in the March issue of The Architectural Forum, an error was made in mention of the architect of the Cleveland Ohio School Board as W. R. McCormick instead of W. R. McCornack.

The Forum regrets that the name B. Leo Steif & Co., associate architects of the Emerman Bldg., was omitted from the March advertisement of the Brasco Mfg. Co.

ANNOUNCEMENT

Competition for Two Scholarships

Two scholarships of three hundred dollars each are offered in the scholastic year of 1922–23 for special students in the fourth year of the course in Architecture at the Massachusetts Institute of Technology. They will be awarded as the result of a competition in design under the direction of the Committee on Design of the Department of Architecture.

The competition is open to citizens of the United States of good character, who are between twenty-one and twenty-eight years of age, and who have had at least two years of office experience. Competitors must furthermore present satisfactory evidence of a knowledge of descriptive geometry.

The competition will be held in July, 1922. Competitors are allowed to prepare their drawings wherever conditions conform to the requirements of the Committee, but these drawings must be sent to Boston for judgment.

Applications should be received before May 15, addressed to Professor William Emerson, 491 Boylston st., Boston, Mass.

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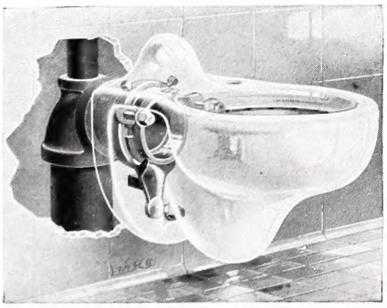
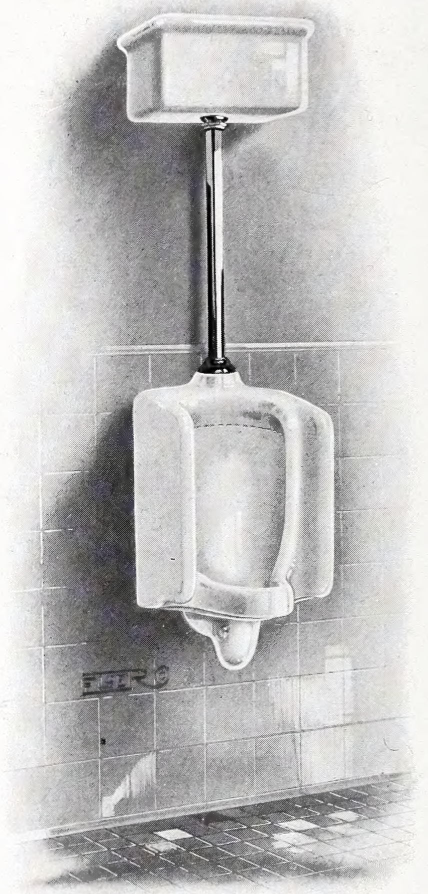


ELJER HANGER *rigid support*



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